COMPUTERWORLD

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Common Problems

National S/3 Group Looks to Independent Suppliers

By Phyllis Huggins
CW West Coast Bureau

CANOGA PARK, Calif. – Showing the spirit of User's Lib, a new national mainframe user's group will actively promote the use of independent peripherals, software and supplies by its members.

The National Association of IBM System/3 Users (Nasu) was formed independently of IBM. "Independently" means, among other things, that it can circulate information about the growing numbers of suppliers who are making competitive or unique equipment to be used with the system.

A manufacturer's user organization normally has a closed-door policy for outside suppliers.

According to Irwin Cohan, president of the group, Nasu's major purpose is individual participation, enabling people with common problems to communicate with each other.

Spotlight on User's Lib

A hospital, school, or heating supplies dealer, for example, can contact others who have the same needs and who can share experiences and programs.

Most of these users are new to computers and are particularly in need of help. Help from IBM costs $22.50/hr for a systems engineer, and IBM software packages are rented.

The S/3 user is particularly cost-conscious since he usually does not have the resources to afford much in computer operation costs.

Cohan estimates that millions of dollars will be spent by this low-budgeted group in re-inventing the wheel at each installation unless a means of sharing is developed. Recently formed, Nasu is already finding warm support. Last week, for example, one California

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Consumer Plan May Reduce Billing Woes

By Edward J. Bride
CW Staff Writer

NEW YORK William Cicero's electricity was shut off because some power company employees mishandled some computer cards. Consolidated Edison says it is sorry and hopes it won't happen again.

After May, when an advanced Consumer Service System goes into the testing stages, such occurrences will become easier to avoid, officials hastened to say recently, after the Cicero problem was resolved.

A Bronx luncheonette owner, Cicero received an erroneous bill last December. After showing cancelled checks to Con Ed, he was promised that redundant bills, and threats of power being turned off, would stop.

Somebody misplaced the cards with the "stop" order, causing the "paid" notices to be ignored, and Cicero kept receiving the threats and "overdue" notices, the power company explained.

Finally, in March, three months after it all started, Cicero's power was actually turned off because of what the computerized bill itemized as $342.22 of unpaid electricity usage.

An apologetic Con Ed official told CW there could be "a chance of a couple hundred" erroneous bills a week, but that normally "they don't get that far" to cause power shutoff.

Noting the "computer was operating with false information," the spokesman also stated Cicero's power was restored within "a few hours."

Con Ed's billing program automatically sends a notice if a consumer hasn't paid his bill within five days of the due date. Two additional monthly notices are sent, before the shutoff warning.

Computer for Consumers

A customer information system currently being perfected will go into parallel operation in the Bronx in May. It is devised to give power company employees instantaneous data when customers call with questions or complaints about their accounts.

Under the system, only certain employees will have access to customers' computerized files, and the employee identification number will be the "key" to open the files.

The information will be displayed on any of over 800 IBM 2260 video display terminals hooked into twin 360/65 processors.

Charles Spitz, manager of the Consumer Service System (CSS), said only three manufacturers replied to a bidding invitation, and that IBM was chosen after an "exhaustive evaluation."

Spitz elaborated on savings he anticipates CSS will bring to the company: $5 million through a work force reduction of about 500. The average salary of $10,000 includes overtime and fringe benefits, Spitz noted.

The 14 programs which comprise CSS are already being

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On the Inside

Ampex Terabit Memory (TBM) system uses videotape recording techniques to store 5.6 billion bytes (45 billion bits) on a single reel of standard video tape, enough data to fill up 500 reels of standard computer tape. Each TBM tape module accommodates two reels or 11 billion bytes of data, eliminating shelf-storage and handling of a thousand computer tapes. The expandable system uses up to 32 such tape modules.

University Fire

Terminals Beat Heat

CW West Coast Bureau

SANTA CRUZ, Calif. – Computer terminals survived a trial by fire, smoke and water when the administration building at the University of California at Santa Cruz was gutted recently in a $500,000 to $750,000 blaze.

Sheldon Baehus, administration systems officer and acting director of the computer center, expressed amazement as five Sycor units in a separate data entry area were moved from the scene of fallen timbers, water and total destruction and taken to the computer center where they were plugged in and worked.

The equipment consisted of three key-to-cassette communications terminals, a key-to-cassette terminal with telephone hook-up for direct recording onto tape and a cassette-to-magnetic tape converter.

All units had paint blistered from the heat, and one unit's top panel was damaged.

To get to the cassette-to-mag tape converter, Bachus literally waded through water.

Two cassettes that had been left inside one of the units were undamaged, enabling the university to restore critically needed information on eligible applicants for the fall quarter 1971. Loss of this data would have made it impossible to know whom to contact.

Drives Store Three Trillion Bits On-Line

By Frank Piasta
CW Staff Writer

REDWOOD CITY, Calif. Designed for the large-computer system user with a massive data base, the Ampex Terabit Memory (TBM) uses videotape recording techniques to allow on-line accessing of the equivalent of up to 32,000 reels of tape.

The equal in random access systems would require about 350 full disk systems of the IBM 3330 type, Ampex said.

In contrast to most tape systems, each record on TBM tape is individually addressable. Addresses are recorded on a longitudinal track at 200 bit/in., and may be searched in either direction at 1,000 in./sec.

The TBM system is designed to be used with the largest available computers, such as the IBM 360/65 and up, and the Univac 1100 series. It can be directly attached to the standard IBM 360 I/O channel.

An Ampex Extended Core Memory is used as a buffer between the main memory and the tape system.

The cost of the TBM, a spokesman for Ampex said, is 20 to 50 times less than other mass storage devices, such as the IBM Data-Cell or the RCA magnetic card Mass Storage Unit.

The TBM will be shipped in about one year and prices will range from about $500,000 to $3 million, depending on configuration. At the upper end, the cost is about 0.0001 cent/bit, the company added.

Ampex has used videotaping techniques to produce an on-line system that can access up to 350 times more data than any previous erasable digital storage system, according to the company

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Con Ed Consumer System May Eliminate Billing Woes

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tested in a laboratory atmosphere, and will run in dual mode for three months before being fully evaluated and spread to the other boroughs.

There are approximately 50 "sample accounts" undergoing laboratory testing, and when the system is implemented in the Bronx, each "real" account will be checked for accuracy before determining the success of CSS.

Most of the business programs were written by in-house personnel, using Cobol for accounting and BAL for file maintenance, Spilz related.

Spitz looks forward to fewer errors through direct data entry and, of prime importance, to improving customer relations through speed and accuracy.

When an inquiry is satisfied by the terminal operator and no further action is required, that terminal operator's number will be entered, with a notation regarding the inquiry in the customer's file for future reference.

An example would be comparing two years' power usage to explain a sudden drop or increase in the bill.

The only exceptions to this recording would occur when the inquiry was a service request or other matter which the operator could not fully handle.

There will be a total of 18 different display formats, including the customer inquiry history, general billing history, cash history, service requests and replies.

A special "White Paper Committee" listed five requirements for the system, all of which were designed into CSS:

- Daily billing capability.
- Standardized address files, so data could be retrieved by address as well as by account number.
- Complete video displays of customers' accounts.
- Direct data entry so orders are entered directly into accounts.
- A management information system for special reports.

The twin processors will prevent interruptions of service in event of a breakdown.

But a different kind of backup was discussed in the power company's internal publication, *Around the System:* "All material available on the video displays will also be on microfilm in case of a major outage of the computers and for permanent reference."

Tax Taxes Halifax Power

HALIFAX, N.S. – An unexpected sales tax on electricity, plus "too fast a conversion" to a new computer system, caused a flurry of problems and delays in the computerized billing procedures at Nova Scotia's Light and Power Co. Ltd.

The problems started around the time the company acquired a new Univac 9300 and moved to a new building. Billing activity was complicated by passage of the new tax law.

The tax program was implemented without being tested, proved erroneous, and created faulty master files, a utility official said. As a result, some householders received bills for as much as $275,000, and others went as long as a year without an electric bill.

A special program was written to extract the accurate customer records from the faulty master file, while the 150,000 other records were being corrected manually. Started nearly two years ago, conversion was completed late last year.

TBM Accesses Equivalent of 32,000 Tapes

(Continued from Page 1)

Using special tape drives that incorporate a rotating block of eight heads and standard 2-in. videotape, the TBM system can store from 90 billion bits to 3 trillion bits of data with configurations ranging from two to 64 drives.

The system is divided into two-drive modules each of which can handle a 10-1/2 in. reel of tape with a capacity of 5.6 billion bytes, equivalent to about 500 reels of standard computer tape, according to Ampex.

Data is recorded on the tape by the transverse movement of the heads at 800 in./sec while the tape is moved at 5 in./sec. Each bit is recorded twice, by two separate heads 3/4 in. apart, in order to reduce errors.

The resultant bit density is 1.4 Mbit/sq in., approximately twice that of a 693K bit/sq. in. density achieved by General Dynamics in its military-oriented Unidar system. Due to redundant recording, a data density of 700,000 bit/sq. in. is achieved in the TBM system.

As might be expected, access time is slow compared with disk. In a system using four controllers, allowing four parallel searches to take place on four separate drives, average access time is about 2 sec to 3 sec.

Tape movement during searching is rapid at 1,000 in./sec, but a full reel of 2,400 ft tape would require about 28.8 sec to search.

The slow access time can be offset by the very fast transfer rate when the record is found. The device has a rate of 750,000 byte/sec per I/O channel.When four channels in parallel are used a maximum of 3 Mbyte/sec can be transferred, Ampex said.

Bulk memory can be used as an intermediate storage between the TBM and main memory, allowing blocks of 1Mbit or larger to be transferred, offsetting the slow access time somewhat.

A system can have as many as six controllers, allowing six parallel searches to be conducted.

Although there will be no changes required in operating system software, Ampex said that new accessing methods might have to be devised.

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S/3 Group to Promote Independent Use

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community offered over 100 programs covering all phases of municipal DP work, including utility billing packages for electricity, water, sewerage and garbage collection.

Announcement of the formation of the group has brought a response to the organizers of roughly 10 letters a day, plus phone calls. The letters illustrate the serious need for this type of organization.

Examples include:

"We have recently installed a Model 10 and I agree there is a "dire need for a group such as this . . ." ". . . We have an 8K card system and have already developed a couple of routines that could be of use to others. At the present, we need to develop a routine to read the address data switches. . ."

Fifty percent of the letters, Cohan reports, are from rural areas where they do not even have an IBM office close by.

Reliable sources put the number of installed S/3s at 2,000, with 4,000 more to be installed by the end of the year. The goal of Nasu is 1,500 members by the end of the year and 35 chapters.

Nasu is a nonprofit group and membership is $30/yr. For information contact Nasu, 23331 Vanowen St., Canoga Park, Calif., 91304.

Management Once Again Told of Its Responsibility

CHICAGO – Top management is to blame if an organization's computer system has not lived up to expectations and helped solve key companywide operating and management problems.

That's what Don W. Montgomery, president of the Celina Group, told the Conference of Mutual Casualty Companies' Data Processing Seminar here recently.

Montgomery called the computer "one of the most undersold, underestimated and unappreciated inventions of the modern world."

For the most part, "the one fundamental error top management has committed is that it has thus far been unable or reluctant to assign the computer an effective organization position in their companies."

"For many companies, the conversion of routine administrative and accounting operations to computer is complete," he said.

"But its greatest potential lies in helping solve key operating and management problems companywide."

The computer department should no longer be an adjunct to the accounting department because "its purpose is operational now and embraces the whole company."

"Now that most accounting functions have been converted to electronic data processing, the EDP responsibility should be companywide in scope and tied in closely to the top of the organization," he said.

Montgomery, who heads 10 companies in the Celina Group, including Midwest Data Systems, Inc., believes "teamwork is the key . . . Where top management provides leadership, and operating managers actively and enthusiastically cooperate with professional computer staffs, major economic achievements can result."

Balky Companies May Find Names In Rocky Mountain BBB Computer

DENVER – Firms unresponsive to consumer complaints, plus those creating major consumer problems, will soon have their names listed by the computer at the Rocky Mountain Better Business Bureau, headquartered here.

The planned application will be in addition to categorizing over 200 consumer complaints per working day, according to BBB President W. Dan Bell.

The computer was fed more than 28,000 complaints during the last six months of 1970, Bell remarked, adding the listings should cause businessmen to improve their operations by highlighting specific problems within general trades.

Now, the listings will highlight specific companies.

The businesses will also receive direct assistance from the computer, Bell noted, when the machine takes on the task of warning groups of firms suddenly experiencing abnormal complaints or deteriorating customer relations.

Misleading advertising or unwary employees mishandling customer complaints could bring such events.

The computer may also be programmed to predict consumer buying intentions.

The Rocky Mountain BBB implemented its categorization system on an IBM 360/20 last year [CW, Oct. 28], after earlier recommendations from the Stanford Research Institute.

Complaints are categorized by cause (nondelivery, defective goods, late delivery, etc.), company type or trade group, product and service offered.

Insurance Firms Setting a Trend?

SYRACUSE, N.Y. – Among the most significant users of computers, in size at least, are insurance companies, and their employment policies may be trend setters that will show other users how to economize and still get the job done.

Two of the biggest insurance companies, for example, have their computer sections on a three-day week, having given up the four-day idea as unsuitable or too unpopular.

While Metropolitan Life in New York City has its DP workers on such a schedule [CW, April 14], upstate Mutual of New York (Mony) does, too. Both companies have had a three-day-week, 12-hour-shift in operation for about two years.

Thomas Davis, Mony's personnel manager, said this shorter week saves the company in terms of increased efficiency, since there is one less shift-change a day. Mony implemented the system when its computers were put to work around-the-clock in 1969.

Manual System Used

Computers out of Running as Off Track Betting Begins

By a CW Staff Writer

NEW YORK – Off track betting is off to a fast start, but the computers were an early scratch.

Like the average bettor dreaming of that big win someday, the New York City Off Track Betting Corp. (OTB) promoters are still dreaming of computer systems and complex interfaces. For the moment, however, it appears that OTB could make money by taking bets on when the computer system will be up.

Pencil and paper and punched tape have replaced the computers, and OTB officials now estimate that it will be several months before the computer system is debugged.

A Computer Sciences Corp. (CSC) spokesman said that the difficulties involved a communication problem between the PDP-8s and the 360/50s. He said the system works well for a long time and then suddenly breaks down. He declined to give other details.

The manual system proved slow and cumbersome and Grand Central Station looked like Grand Central Station for the first time in years as hundreds of bettors waited in line for over two hours to place bets at the OTB windows.

The problems were further increased by the surprising popularity of OTB. Howard Samuels, OTB president, had predicted that $10,000 a day would be bet, but OTB took in $62,306 the first day and more on following days.

Based on Computicket

The OTB computer system is being developed by CSC based on its unsuccessful Computicket system. Under the plan, each OTB office would have special ticket issuing machines which would be directly connected to PDP-8 minicomputers to concentrate the data. The minis would pass the bets on to twin 360/50s, which would keep records and pass on betting summaries to the tracks.

OTB originally planned to interfsce directly with computers at the race tracks. But this proved inordinately expensive, and it was decided to input OTB summaries to track computers with punched paper tape. The Honeywell computer at Aqueduct will not accept punched tape, however, so OTB will buy pari-mutuel tickets just like any other bettor.

CSC has been more optimistic about its computers than even the most naive gambler. It assured CW several times that there were no difficulties, and even two days before OTB finally opened, the CSC spokesman was predicting that the computers might be used.

Paper Forms

Without the computers and special terminals, OTB bettors are required to fill out three-part forms which are validated by a clerk. Bettors write in a code letter for the horse and a number for the race. Critics have charged that it would be easy for a bettor, for example, to change an E to an F or a 1 to a 7, and thus make a losing ticket a winner.

OTB clerks are supposed to compare all winning tickets to the original stub, but sorting through the winning stubs takes so long that the clerks are only doing it for large bets.

OTB has opened with two betting offices and is accepting telephone bets from people who have opened accounts (2,500 accounts with a minimum of $25 have been established). Races at only one of the two operating New York racetracks can be bet on at OTB offices so far.

Each OTB shop telephones its total bets on each race to the central OTB office. The totals are punched on paper tape and input to a PDP-8 (the only computerization so far) which produces a master tape. The master data is sent by teletypewriter to the track.

Computer Helps Raise Cane in Honolulu

Special to Computerworld

HONOLULU – The care and breeding of sugarcane is being analyzed by computer in Hawaii.

In an application of computers unique to the 50th state, the Hawaiian Sugar Planters' Association Experiment Station uses an IBM 1130 to process data obtained from the analysis and research of sugarcane.

HSPA, a nonprofit trade association supported by the 23 sugar companies of Hawaii, operates its research center, the Experiment Station, here. The Experiment Station is engaged in research work on sugarcane in nine departments – agronomy, chemistry, entomology, experimental statistics, engineering, genetics, pathology, physiology and biochemistry and sugar technology.

The computer is used to perform statistical analysis on such parameters as parts of cane, purities, irrigation, breeding and variety selection, predicting optimum age of harvest, determining the effect of weather parameters on sugar yield, sugar factory optimization design.

It also is used to plot graphs for determining rat and borer damage in sugarcane fields.

Machine Not Guilty In Music Synthesis

NEW YORK – In today's world, the computer gets blamed for many ills, but RCA's Dr. Harry F. Olson makes it clear that in electronic music synthesis, the composer, not the computer, must take responsibility for the final product. He says that "analog and digital synthesizers can produce any tone whatsoever regardless of whether it has ever been produced before or not.

"However," he says, "the composer operating the synthesizer, regardless of the method employed for the electronic synthesis of music, is the final judge of the rendition."

Olson's remarks appear in an article in the April issue of the IEEE Spectrum.

Under the title of "Electronic Music Synthesis," the article covers the entire field starting with descriptions of the properties of a musical tone.

The ABM Hassle-Part I

Backers Cite Import of Simulation

By Joseph Hanlon
CW Staff Writer

There is no immutable law that large computer systems cannot be adequately debugged – the procedures already exist, and all that is required is sufficient time and money, according to backers of the ABM (anti-ballistic missile). These computer professionals argue that the ABM computers can be made to respond correctly and with a high degree of reliability, and they dismiss as "superficial" arguments to the contrary.

Supporters of the ABM interviewed by CW stressed that they were only arguing that it is feasible to properly debug the ABM computers. They said that they expected the government to follow the necessary procedures, but had no direct evidence as to whether or not the government actually will.

Computers are the core of the ABM system. They will control the radars and coordinate all information. They must track offensive and defensive missiles and cope with decoys and radar blackout caused by nuclear blasts.

Supporters of ABM readily agree with opponents on four points:

- The ABM computer system is at least as large and complex as any computer system ever built.
- The very nature of the ABM system prevents actual field testing of the entire system.
- Debugging the system, therefore, will depend on simulation.
- Simulation has never been successfully used on such a large system.

The antiballistic missile (ABM) system has come under renewed attack from opponents who claim that the computers will be unlikely to ever work properly.

No computer professionals have come forward to defend the ABM, but CW did find several who were willing to discuss the issue if their names were not used. In general, they are connected with ABM contractors.

Those interviewed were unwilling to publicly debate the issue or allow CW to identify them because of an unwillingness "to dignify the opponents' arguments" and because of a strong faith that the Department of Defense is giving ample consideration to those arguments.

The dispute is over the implications of these four points of agreement.

What follows is the response to the most common criticisms of opponents.

Actual tests of the full ABM system are impossible, because it is not possible to stage a nuclear war for a test. Without such a live test, will it be possible to debug the software?

Testing will rest heavily on simulation. Data will be taken from individual missile-antimissile interception tests now being conducted in the Pacific Ocean. To this data will be added the expected effects of nuclear blasts. The results will be varied and multiplied manyfold and fed into the computer system to simulate full-scale attacks.

Supporters of the ABM argue that such tests are realistic because a missile attack is the sum of individual incoming missiles. Further, they argue that if such simulations are extensive enough, they will show up such problems as system overloading that might be caused by the extension from one missile to an entire attack.

Critics of ABM have charged that such simulation has never succeeded before, and that it is unlikely to succeed now. But supporters contend that it is unfair to compare the ABM with large commercial systems such as airline reservation systems.

One expert declared: "If you are willing to invest the effort, it is possible to do a lot more through checkout than has been done on past software systems. In other systems people have not been driven to attempt that level of checkout because economically it wasn't worth it – you could get by having the bugs stirred to the surface as you went along.

"Most software developers, including many of the critics, have never had to associate themselves with the kind of reliability effort that needs to be done with the Safeguard ABM.

"To have a large-scale validation, you must design test cases that drive the various parts of the software through enough different paths that you establish a high level of confidence. It's not possible to test all paths, but the branches in the software are all identifiable and they can be checked out on a subunit basis," he continued.

"It is feasible to do very intensive levels of checkout, and these have been done on smaller missile software packages. These packages have been checked out in excruciating detail and have exhibited high reliability," he declared.

The expert conceded that such techniques had not been applied to anything as large as the ABM, but he stated: "These techniques are available now, and it is not a major step to apply them to the ABM."

Many changes will have to be made, both to correct errors found during continuing testing, and to accommodate changing enemy tactics. Won't this introduce errors into the software?

Changes would not be made to the ABM software on-line. Rather, a revised package would be developed and tested off-line through simulation. Thus, the backers note, the changed software would be at least as reliable as the original before it was ever put into use. Such a changeover should take only a few minutes, and could be done at a period of low alert, they claim.

Thus, the question becomes one of constant revisions and debugging in an off-line environment.

"Software development in the commercial community is an undisciplined operation; in that environment any change is a problem," declared one ABM advocate. "You cannot change software and have it work unless you develop and control that software under a very firm configuration management system.

"If you go to any big computer company and try to look at their Fortran compiler or an operating system, there isn't anybody that really knows what's in them and the literature doesn't describe them.

"That doesn't mean it can't be done. That just means it isn't cost effective to have really tight configuration management to insure that changes are really well controlled.

"The kind of configuration management needed by a one-time system like the ABM is not new; it has been done before. But it's not the kind of effort commonly known to the part of the computer industry that has only been associated with commercial applications."

Simulation is based on the assumption that one has an adequate knowledge of offensive and defensive missiles. The second part of this article will report the ABM backers' views on this issue, and on the implications of the Apollo program for the ABM.

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News Wrapup

Labor Dept. Jobless Plan Advances

WASHINGTON, D.C. – The Labor Department is moving ahead with a $42 million program to aid jobless aerospace and defense technical people. Contact for these individuals with the program will be through their state's public employment office.

Initially, the program – which will provide job finding assistance, retraining, mobility provisions and skill transferability studies – will be concentrated in 14 selected high unemployment areas. They are Huntsville, Ala.; Los Angeles; San Diego; Orange County, Calif.; San Jose, Calif.; Cape Kennedy, Fla.; Atlanta; Boston; St. Louis; Long Island, N.Y.; Philadelphia; Dallas; Seattle; and Wichita, Kan.

The $42 million will be used as follows: $25 million for job retraining of about 10,000 people; $10 million for relocation grants to those who find jobs in areas beyond their commuting range; $5 million to provide job search grants to enable 20,000 applicants to explore specific job opportunities outside their home areas; and $2 million for skill conversion studies.

Nixon Depreciation Liberalization Called Illegal

WASHINGTON, D.C. – A leading tax authority has charged that the Nixon Administration acted illegally when it ordered into effect, without any new legislative authority, a depreciation liberalization that would amount to tax reduction of some $3 billion annually for business.

Boris I. Bittker, Sterling Professor of Law at Yale University, made the accusation in a statement filed with the Internal Revenue Service, which will hold public hearings on the issue next month.

"The Internal Revenue code does not authorize the taxpayer to select, or the Treasury to accept, an artificial period of time, unrelated to the asset's useful life, as the proper method for depreciating its cost," said Bittker.

Communists Find Much Truth in Credit Report

SANTIAGO, Chile – Communists, while avowing little faith in capitslist ways, seem only too ready to believe such byproducts of capitalism as credit company reports.

Howard Edwards was jailed by the Chile Government because of a Retail Credit Co. report which stated he worked with the free Cubans during the Bay of Pigs and was a member of the CIA. Edwards had apparently received the cooperation of a former "inspector" of the firm in falsifying his own report.

Rep. Cornelius Gallagher (D-N.J.), whose privacy subcommittee held hearings on the firm and its reporting practices in 1968, expressed surprise that Communists would be so eager to believe "reports which most capitalists regard as a necessary evil and which they express little confidence in."

Computers Slip Into Maine Liquor Stores

AUGUSTA, Maine – "As Maine goes, so goes . . . " may also apply to computerization of recording liquor sales.

The Maine Liquor Commission has installed specially designed point of sale terminals in all state stores. When selections are called for, clerks punch sales data on paper tape which replaces the written order slips. Printed adding machine tape is kept as a backup, and the customer receives a sales slip. The paper tape is converted to magnetic tape at commission headquarters, and then processed.

Each store manager will receive a weekly readout, listing sales volume of each item, figures for the year to date, current inventory, average sale for the past eight weeks, level of stock to be maintained, and items that should be ordered. The individual manager places orders, as he is familiar with the local situation.

Grosch, Hammer to Address ASM Seminar

SEEKONK, R.I. – The "communications explosion" of the early seventies will be a focal point of the second annual Graphics and Communications Systems seminar here next week.

Gov. Frank Licht will open the April 28 meeting, sponsored by the Rhode Island Chapter of the Association for Systems Management.

The seminar chairman, the Rev. George C. McGregor of Providence College, said discussion topics include present and planned uses of computer/communications technology, including government and private data banks and their "potential threat to individual privacy and rights."

Speakers will include Dr. Carl Hammer, Director of Computer Sciences at Univac, Dr. H.R.J. Grosch of the National Bureau of Standards, Dr. Paul Oliver of Univac and Robert E. Smythe of Sanders Associates.

Man-Machine: a Marriage Born of TLC

PITTSBURGH – The romantic and oftentimes erotic relationship between man and his sleek machine, the automobile, may soon be victimized by the adulterous computer.

A University of Delaware historian, George Basalla, said that men now are substituting the auto for the female as a sex object. Men, particularly Americans, have a "highly emotional and erotic relationship with the machine, with the car, the locomotive and the computer the most endeared."

But the computer may usurp the car's role, Basalla concluded. "Sociologist Henry Berger is predicting computers will be soon providing mass tender, loving care," he said.

Computerization at Montgomery Ward Reaches Direct Merchandising Programs

CHICAGO – It has been said that Kermit A. Pickett, now a corporate vice-president of Chicago's Montgomery Ward and Co., revolutionized retailing with data processing.

Pickett says that computers, with their power for speedy efficiency, best demonstrate their full value in American business. "Their finest capability," he says, "is that of providing quick and accurate management information."

Significantly, Ward's reports a $25 million drop in the amount of inventory the firm normally had to carry and a 7,000 person employment drop, mostly by attrition over the years, and credits the computerization of its customer accounts and accounts receivable for the savings.

Karmit A. Pickett

Also, Ward's recently announced that its catalog operation, in the red for years, now is using black ink.

With 11 DP centers strategically placed around the country to serve the firm's 460 stores, Ward's is employing computers not only in administrative applications such as payroll, accounts payable, customer accounts and accounts receivable, but also in direct merchandising programs.

Replenishment

Seventeen of the Ward's stores around the country are now completely computerized. Programs in replenishment systems account for items sold out of stock of a given store and reorder when indications reveal that replenishment is required.

Pickett has always maintained that the most valuable management information begins at the point of sale. Presently Ward's uses NCR 5300 registers which provide tapes that are read in the data centers on NCR 420s or IBM 1287s. Register tapes are mailed to the centers now.

The programs, run on a 360/50, not only measure and react to stock flow, they analyze trends in colors and styles and sizes in relation to each other for merchandising planning and for seasonal products.

In effort to get that vital information back to management even faster, Ward's is now planning on installing NCR 280 retail system terminals. More than 1,500 of the terminals will be installed in Ward's stores in 1971 and 1972.

"For many years," Pickett says, "we have been seeking a system of electronically recorded merchandise information at the point of sale."

All the information of a particular sale will be recorded on tape in the store's magnetic data recorder and then, at the day's close of business, all sales transaction data will be sent over leased long lines to the store's reporting data center.

DP Profile

Since the clerks in the stores are not intended to be DP experts and since one of the main purposes of computerization was to free the sales clerk from paperwork and offer her more sales time, the terminals' visual display panels will provide the clerks a step-by-step instruction pattern to enable them to complete the transactions accurately.

Also, sales taxes will be computed automatically, and the clerk will be freed of the chore of checking the status of a customer's account on credit purchases since the account's status will be displayed in a visual code.

'See You at the Hop'

PALO ALTO, Calif. – Computer dating firms generally charge from $20 to $500 for their services; some charge more, but at least one charges a lot less.

Twenty-five cents, to be exact.

The "firm" is actually a nonprofit sub-group of the Los Altos High School Computer Club, two members of which programmed the computer and designed the questionnaire used in the matches.

The operation currently operates only at the local high school, but the student programmers would like to expand to two others, to increase the likelihood of successful dates.

The students have been given free access to a Burroughs B5500 at the Remote Computing Corp., where the matching program is run.

Ultimate beneficiary of the service is the high school's literary magazine, to which all fees are donated.

Lieutenant Governor Strong Advocate

State Government Proud of Emphasis on Technology

By Phyllis Huggins
CW West Coast Bureau

SACRAMENTO, Calif. – "It's the only way to keep government from being in a mess. We couldn't function without computers," said Ed Reinecke, a mechanical engineer, and now lieutenant governor of California.

"By the time California has completed its EDP master plan we will not only be ahead of all the states but ahead of the Federal Government in our utilization of computers." He credits the receptive attitude in the state which favors placing computer responsibility at the highest level of government. The top politicians in the state are directly involved in the applications of DP.

By legislation, an Office of Management Services was created to develop and guide the uses of computers in the state. This agency reports directly to Reinecke.

The head of the office, Dr. Charles Smith, is an appointee of the governor.

Commenting on this set up, Reinecke told CW: "We have a strong belief in the value of the use of computer technology to assist us in the resolution of public problems. It was therefore fundamentally important that instead of being buried in a corner of some department, computers be brought up to top-level responsibility."

Reinecke has the added advantage of being a technical man and is not intimidated by computers.

"Without centralized control you end up with hometown rule," said Reinecke. "Everyone wants their own computer. We had some installations that were being utilized only 5% to 15% of the time." In the three years that computers have been under top executive supervision, their use has proliferated but the number of installations has actually decreased.

Under an extreme austerity plan, the governor's proposed budget for fiscal 1971-72 has an 8% increase for computer operation, now accounting for 1.4% of the total budget or $79 million for 47 state government installations, plus the university and state college centers. As such, it is an easily identifiable budget target and is under fire from state Sen. Stephen P. Teale (D-West Point).

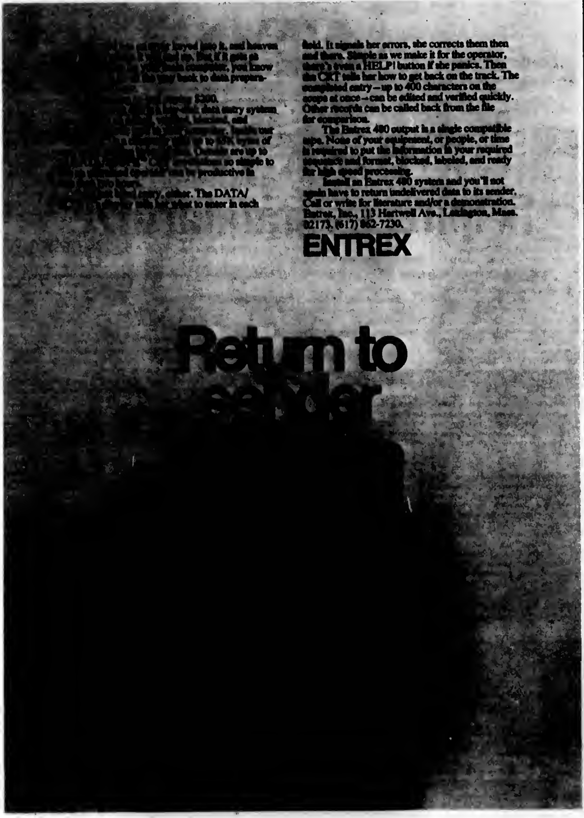
The California Department of Highway Patrol has developed and has in use a data bank on stolen cars and wants another computer to upgrade it.

The Office of Management Services instead wants to centralize all law enforcement computers.

As Smith explained, "We have some cases where there is more than one terminal in use connecting law enforcement people to more than one agency's data bank. If we can pool these and have only one terminal needed, the savings are obvious."

The highway patrol insists that full use of its own computer set up is the only way to completely optimize its effectiveness.

The state is a member of a group of cities, counties and boards of education which meet to share programs and efforts. Reinecke emphasized that the main advantage is that duplication of effort is minimized. "Why should everyone have the same specialized data bank when instead one can be set up and all concerned bodies can get tapes from that one?"



SAC Updates Data Plan

HQ SAC, OFFUTT AFB, Neb. – Installation of new equipment has enabled the automated Intelligence Data Handling System to provide expanded capabilities to store target data information.

Located in the Strategic Air Command Headquarters here, the Target Programs Division is responsible for the development and maintenance of computer programs that provide computer-derived target intelligence data and services to the Strategic Air Command staff and Joint Strategic Target Planning Staff in support of the Single Integrated Operational Plan (Siop).

The capability to provide computer support in production of the Siop was greatly increased recently with the upgrading of the division's IBM 1410 to an IBM 360/50 Model 1, interfaced with the Visual Analysis Subsystem.

Railroad Gets Management Aid With T/S

ST. PAUL, Minn. – Burlington Northern Railroad is using computer techniques to analyze pulp and paper shipments for revenue-to-cost relationships and to determine profitability.

"We wanted a measure of margin," said Gary Schlaeger, market manager for pulp and paper products. "We can't manage what we can't measure.

"Often some time passes before we can determine whether we profited on a movement. It's important to analyze a massive amount of information quickly; if we're handling unprofitable business, we want to know promptly so we can recommend remedial action," he said.

Information on rail shipments is logged into a teletypewriter terminal in the Burlington Northern's general offices. Over this terminal, connected by telephone lines to the Service Bureau Corp.'s time-sharing computer in Cleveland, an analyst types the shipment's originating station, destination station, total haul miles, commodity code, the numbers of cars used, total tonnage and total revenue and cost.

From this information the Burlington Northern program, Anpac, stored in SBC's time-sharing system, calculates the following business requirements: tons per car, revenue per car, the costs per ton, per car mile, per ton mile, and the costs per ton, the margin per car, the total cost, total margin, ratio of margin to cost, ratio of margin to revenue and the ratio of revenue to cost.

With this information in the computer and arranged in files, the respective commodity market manager can analyze revenue and profitability rapidly and conveniently on a number of station-to-station movements.

The Anpac program produces a series of sorted analytical reports. One key report shows profit margins in decreasing order – immediately highlighting the shipments that are making or losing the most money. Another exception report which shows all cost ratio equal to, or less than, 1.0 is produced for further analysis.

Paris Metro To Automate

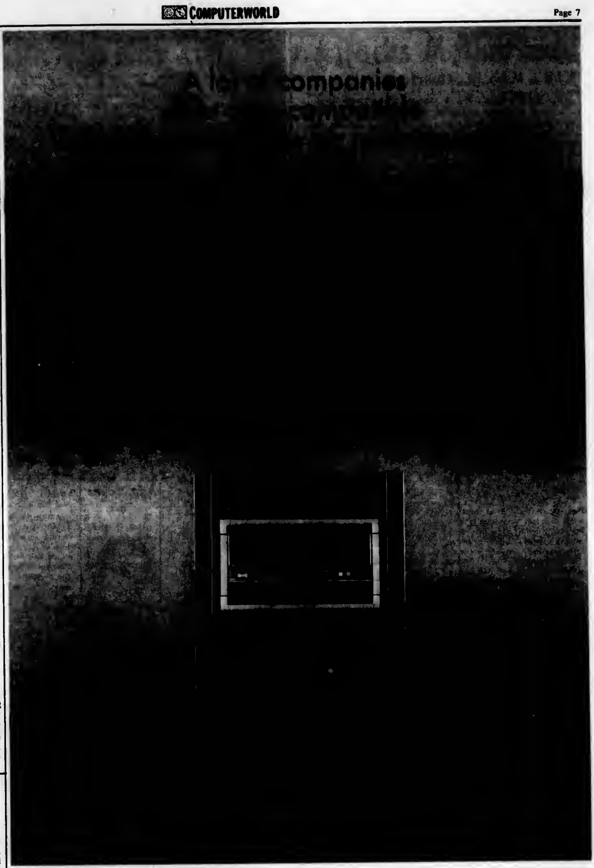
Special to Computerworld

PARIS – The Paris Metro, the underground railway system, will have the largest automated ticket system in the world, using 14 computers – type CII 10020 – 350 ticket distributors and 400 toll gates at its 270 stations.

The Metro, with its mixture of ancient and modern, provides a main transport system for millions of Parisians and visitors.

The new system will automatically issue magnetically striped tickets from coding and price information supplied by the computers. Access to the platforms and exit will be controlled by automatic toll gates.

The system is scheduled to become operational in the summer of 1974.



Editorials

Who's Who in America

A high-capacity tape storage system announced last week will make it possible to store a dossier on every living person in the U.S. – and to retrieve any one of them in a maximum of 28 seconds.

There are many worthwhile purposes that this, and other such mammoth storage devices, can be put to.

But dossier collecting, in a *laissez faire* atmosphere, is not one of them.

Aren't You Listed, Either?

And speaking of who's who, the three-volume set of *Who's Who in Computers and Data Processing 1971* arrived last week. Copublished by the *New York Times* and *Computers and Automation*, this directory of the DP community lists more than 15,000 people.

But if you have been working your fingers to the bone over computer projects for years and didn't get a listing, don't feel bad. Among others whose names are conspieuous by their absence are Seymour R. Cray and Thomas J. Watson Jr.

Letters to the Editor

Professional Benefits Should Be Shared

In response to David H. Greenberg's evident enthusiasm for more malpractice suits in the computer industry [CW, March 17], I think his suggestion for lumping software types together with lawyers, accountants and doctors is a fine idea, providing we can obtain some of the other "professional" benefits, namely:

- Establishment of a software-related profession where membership might require a technically related degree (or two) from an accredited college, with several years of additional "hands-on" experience.
- Limitation of the software services business to firms wholly owned, as partnerships, by our professionals. (This keeps big money interests and growth hungry corporations away.)
- Establishment of standards or "ethics," which would prevent member firms from competing with one another, either through advertising or other devious forms of business solicitation.

Shortly after these steps have been implemented we should be able to afford, between trips to the Riveria, the ultimate luxury of "terminating" undesirable clients, then we can afford malpractice insurance.

Denis E. Ables

Washington, D.C.

Professional Slap

The article by David H. Greenberg in the March 17 issue suggests that not only hardware manufacturers but also "independent software firms and contract programmers" have overlooked the reality of legal action based on breach of contract.

After setting forth overly simplified standards of conduct, Greenberg asks the rhetorical question: "... how many lawsuits that could have been filed, never have. The possibilities are astounding." Whose possibilities?

I suggest that beneath Greenberg's litigious enthusiasm lurks a naivete that is sure to insult the business community. It is certainly a rude putdown to suggest that "So few business executives really understood computers to begin with that when breach of contract, negligence and fraud arose they didn't recognize it or were ashamed to admit it." He proliferates such ingenuous bromides with a slap at his own profession – "Even if an executive had the courage to raise the question with his attorney, there were too few attorneys in the country who knew what kind of questions to ask."

Let us all hope that the "astounding possibilities" in Greenberg's article are not too quickly explored by the shamefully ignorant business executive who retains an incompetent attorney who doesn't even know what kind of question to ask.

Richard C. Sughrue

Law Offices
Washington, D.C.

'...We Have Failed'

As "experts" in DP systems we have failed our clients since the dawn of computers. Through our repeated efforts in poor design, we have encouraged the layman's misunderstanding of computer syatems, his lack of confidence in data processing and his mistruat of our profession. Who can fault him for the attitudea of "it was a computer error" and "if it's on the computer it's fouled up"?

Hopefully all of us have gained from Alan Taylor's examples. As analysts and managers we must continually be alert to ways of avoiding poor design. As a profession, we need more publications like CW which keep us alert and informed of subtle techniques and remind us of fundamental principles.

John R. Blair
Senior Systems Analyst

Systems Analysis Inc.
Bellevue, Washington

ACM's Ombudsman Program Represents Ecumenical Movement Among Societies

D.C. Data-Line

By

Alan Drattell

WASHINGTON, D.C. – The Association for Computing Machinery has taken a bold, imaginative and significant step by announcing plans to set into motion an ombudsman program.

The concept of an ombudsman, although not new, is an excellent approach for the computer industry to dispel the all too familiar "blame-the-computer syndrome" that exists in the real world beyond the air conditioned EDP rooms.

The idea for the program was advanced by ACM's president, Walter Carlson, who said that two events last September "crystallized the problem for me neatly."

On one hand, "during a late night radio interview show at ACM '70, a group of distinguished computer experts was extolling the accomplishments of our profession by saying 'the computer does this, the computer does that, etc.' It was clear that the host of the show and by extension the radio audience were accepting this personification of the computer."

Secondly, "a senior government official ascribed a near-miss aircraft incident to computer failure."

The two events were axiomatic of the climate that computer people themselves have helped to create. We have, according to Carlson, helped to bring about "the widespread impression that the machines are the active intelligence of the applications rather than humans."

Thus, when a housewife gets an incorrect bill from a retail store, she blames it on the computer. When a lonely individual has an unfortunate experience with a computer dating service, he or she blames it on the computer. And when New York City mails out welfare checks without a signature and date, this becomes grist for the blame-the-computer syndrome.

Organization Needed

"There needs to be not a spokesman so much, but an organization that will encourage voices to deal with many of these everyday problems," Gordon Smith, ACM's executive director, told us. "ACM is 27,000 voices."

And what is additionally intriguing about ACM's ombudsman program is the fact that the professional organization is enlisting the interest and aid of other computer industry groups in the project. The ombudsman program thus has become a kind of ecumenical movement among professional societies. "Walter Carlson has dampened the fires of chauvinism among all of us," Smith added.

The Data Processing Management Association, IEEE Computer Group and the Business Equipment Manufacturers Association are among the other organizations involved. On the government side, the Board of Computer Science and Engineering in the National Academy of Sciences is also being enlisted to help reach thought leaders in the Federal Government.

"In talking with Cal Elliott (executive director) of DPMA," Smith said, "he told me that when we have some chapter eager to go ahead with the project he'll talk with his people at the DPMA chapter." IEEE chapter members in the same area would presumably become involved, too.

Meanwhile, Bema is being set up as sort of the "industry spokesman" – as a clearing house, or as really a national ombudsman. "The chapters would respond locally," Smith explained, "and Bema nationally. For example, on something like the Apollo shot where the ahort was blamed on the computer, Bema would undertake to jump in and try to find the facts as quickly as possible and then issue a press release."

Of course, at present the entire program is in a very initial phase.

ACM chapters have responded enthusiastically to the project, according to George Capsis, who is coordinating the program at the society's headquarters in New York.

Within the next few weeks, one or perhaps more "pilot" chapters will be chosen to go ahead with the project. ACM headquarters will provide a two-day orientation seminar for the chapters involved to develop the formal response structure for ombudsman action.

Harvard Approach

"The seminars will use the Harvard Business School case study approach," Smith said. "This is where you take a case and let the group try to solve how you would handle the particular situation."

In this initial phase, Smith emphasized that the local ombudsman would restrict himself to fact-finding and trouble-shooting. "We've got to earn our spurs and get some experience,". he added. "We're writing the book as we go along. The strength of the whole project is that it's an amateur effort, but it's also the weakness."

Down the pike, ACM has in the works an idea for formation of a TV production company to package a computer quiz to be sold to local TV outlets or a network. This approach, being used successfully in France, according to Smith, would reach a huge segment of the American public through a powerful medium of communication.

"The production outfit would be a matter of getting some TV people interested in formatting a company of this type," Smith said. "We'd have to sell them on the idea that the computer quiz could be another Sesame Street."

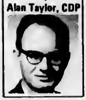
On balance, the ombudsman program is only in the raw stages. Refinements will come later. And in between there will be many slips and pratfalls. It is the type of project, however, that is needed, and ACM is to be commended for having the guts and foresight to come up with it.

Making Myths, or Why Efficiency Attacks Motherhood

The Taylor Report

By

Alan Taylor, CDP



I had a delightful letter recently from the manager of a large installation. He wrote that his systems analyst had just come back from Mike Kavanagh's course on Cobol optimization, and as well as bringing back what he expected him to – good efficiency methods of Cobol – the manager commented, "We were really startled by one revelation that the system programmer threw at us: A binary search is slower than sequential on small files, or '10% increment loops' on large files.

"This was a bolt from the blue and it was like attacking motherhood. It is certainly a classical example of what is logical to the mind is illogical in programming.

"Certainly it seems a crime to take longer to search less items quickly because of what really amounts to inefficiencies in the compiler. I wonder if you could not drum up more business for Kavanagh if you mention this in your report."

I liked his letter both because it showed that people not only could benefit from the courses, but also were actually doing so.

You may recall that in my previous mention of the course [CW, Jan. 20], my story had really been about the way that people in the operational area, the programmers, and the systems analysts played "Round Robin" with efficiency responsibility and let it fall between their stools! Rather a negative comment altogether.

Also my mind was taken by the idea that adverse comments on the binary search are like attacking motherhood!

Had a Reason Originally

My correspondent assumed that his previous beliefs had been mistaken because "what is logical to the mind is illogical in programming." I do not think that in itself would have been good enough if there originally had not been a real basis for believing in hinary search.

Let us consider some of the early machines that I used to work on. There was Univac I, with a thousand word memory, and an efficiency that was based on a cycle going through its mercury tanks. It was a 10-word cycle as I remember it.

There was Pegasus, and the Elliott 402 with its drum memories, and the Elliott (or NCR) 405 with a disk memory – also called the NCR 405.

Alan Taylor, consultant, writer, and former editor of *Computerworld*, is prasident of Computer Management Aids Corp. of Framingham, Mass.

The IBM 650 had its drum memory going forward and the Univac File computer had its drum going backwards. Indeed in most of the systems of those days there was a cyclical memory of some type – and most were short of space.

It is important to remember this when thinking about why the binary search methods are so praised. The whole basis was to use a simple programming loop and get it into one cycle of the drum or disk or whatever it was.

Then we had to minimize the number of cycles involved. The number of instructions in the book was normally unimportant!

Number of Loops Important

Binary search does magnificently well for these criteria because it does reduce the number of actual cycles to a minimum. And, unlike 10% increment loop, which is advocated in the Cobol optimization course, it does not require more than one set of programming routines.

In fact, as well as being logical to the mind, binary searching, like most myths of efficiency, has a really good base in antique computing (that stuff we used about seven years ago or more).

It is an unfortunate byproduct of some of our concentration on higher level languages that we have moved away from the hardware, and can no longer see what the real reasons are behind these myths.

Instead we tried to simply notice the apparent results and carry them forward. It is good to find people beginning to explode them now.

While I am talking about Cobol efficiency courses, I might as well also mention the letter from California [CW, Feb. 24] asking about "Charlie's Loop." Charlie's Loop, as the writer pointed out, sounds to be something inefficient, and in fact it often is. It is simply an ordinary loop with very little actual work going on inside.

Clearly the overhead of going around these loops can get quite large, and so their use in unsuitable circumstances does lead to high inefficiencies.

Most programmers can see how to eliminate these inefficiencies, and the point that the course tries to make is when to eliminate them.

Well, I do not know whether my correspondent was right in suggesting that this type of explanation will help drum up business for Mike – but I certainly will not mind if it does. You can write to him at Optimization Sciences, Inc. (yes, that is a new name), P.O. Box 214, 816 Thayer St., Silver Spring, Md. 20907.

Letters to the Editor

'Old Days' Member Has A Few Thoughts on CDP

I thought that I might add my few thoughts regarding the Certificate in Data Processing that is issued by the Data Processing Management Association.

I am a former member of this association going back to the "old days," before it was called "DPMA."

At any rale, when I found out that I could not even take the examination for this certificate, because I wasn't academically qualified, I felt there was something wrong with the association.

I have been in data processing since 1941, which makes it a round 30 years, most of it involving IBM equipment. And I feel that I am qualified to take this exam, because I have managed my own data center, doing service work, for over five years, plus managing three other installations, with a total of more than five years, plus being assistant manager of three other systems for almost 10 years.

Therefore, I am completely in agreement with the Taylor Report [CW, March 3] regarding the necessity of a CDP certificate. And, again, I agree completely with his analysis of DPMA, its objectives, aims and possibilities.

W.G. Woodworth
DP Manager

American Modoc, Inc.,
Davis, Calif.

Taylor replies: Actually, under the grandfather clause, you can take the CDP. However, others with five years' experience cannot – which is the crux of the criticism.

Human Needs Seen 'Barely Relevant'

In the Taylor Report "Why Doesn't Neil Sutter Know His Math Grade?" [CW, March 10], the last-name-first syndrome is not out of order at the top of the card, but it should not appear in the address. On top, it may aid manual operations.

On the bottom, it is an insult that says, in effect: "My computer time is too valuable to waste on addressing a mere student properly."

Note that he has addressed David Windsor first-name-first. (Incidentally, the column labeled "sex" suggests that even the elementary title of Mr. or Miss might be included in the address; or is that too nice an entry?)

The present standards are clearly set by the convenience of the programmer and his software. Clearly, the human only gets in the way of such orderly processes as billing and grading, and his needs are barely relevant.

Michael Richter

Venice, Calif.

Computerworld welcomes comments from its readers. Preference will be given to letters of 150 words or less. Letters should be addressed to: Editor, Computerworld, 797 Washington St., Newton, Mass. 02160.

"Can't you feed this 'hot pants' issue to the computer and come up with a totally impartial answer?"

New Keyboard Layouts Exist, But Nobody Takes Step

By Michael Merritt
CW Staff Writer

NEW YORK – On March 31 the American National Standards Institute adopted a standard for alphanumeric keyboards that further institutionalized the normal typewriter key layout.

As far back as 1918 time-motion studies showed that the traditional key arrangement was woefully inefficient. It has been shown that even a random arrangement of keys is easier and faster than the Sholes keyboard.

One fortunate thing about Ansi standards is that they are frequently revised, for there are alternatives to the standard key arrangement – the Maltron keyboard and the Dvorak Simplified Keyboard, which have proven themselves far superior to the Sholes layout.

The keyboard normally used was devised in 1866 by Christopher Sholes, the inventor of the typewriter. It was designed for two-finger typing, and took no account of letter or word frequency or body mechanics.

Unfortunately, there are a passle of typewriters, teletypewriters, card punches and key entry devices that still use the same keyboard. And there are an awful lot of people who have learned to put up with the Sholes layout.

Like a conversion to metric measurement, it would take time, money and retraining to convert to a reasonably efficient keyboard.

Dvorak Simplified Keyboard

This is one reason the Ansi committee recommended retention of the old layout. The committee made it plain in its recommendation, however, that it would prefer a new key layout. The committee estimated that even a .5% increase in throughput and a .5% reduction of error rate would produce an effective saving of over two million man hours of work a year in the U.S. in the areas of document production (normal typing), communications and direct computer input.

Further Work Important

The committee said that further work in this area is indeed important, and recommended that suggestions be directed to Ansi.

The Dvorak keyboard has been around since the early 1930s. A study by the General Services Administration showed that after 96 hours of training users of the Dvorak layout had a 43% increase in typing speed, a 75% increase in accuracy, and an 84% increase in net words per minute.

The GSA did not adopt the new keyboard, though, and the people who are now marketing training on the Dvorak layout say it was because of political pressure. The GSA study, incidentally, did not even follow the recommended instruction course.

In addition, the qualm of 30 years ago that conversion would require all new machines does not hold true any longer. Not only do typewriter manufacturers offer the Dvorak layout as an option, but new, electric typewriters, especially ones like IBM's Selectric, can be converted easily, or may even be able to conform to either standard easily.

Motivational Communications Corp., which is interested in Dvorak training, claims it is much easier to learn on the new set up. It says the experience of the designer, Dr. August Dvorak, in the 1930s and 1940s indicates that the simplified keyboard can be learned in 25% to 50% of the time it takes to master the old keyboard. It also boasts of a 30% to 70% increase in throughput.

So there it stands, with Ansi stuck with a standard it does not really like, alternatives waiting in the wings that are much more practical, and nobody with the courage to make the jump.

But Britain just went to decimal currency . . .

Senator Would Bar Release of Data By Tax Services

WASHINGTON, D.C. – Commercial tax services would be prohibited from releasing information about a taxpayer without his permission under a bill introduced by Sen. Charles McC. Mathias (R-Md.). A similar bill was recently introduced in the House of Representatives by Rep. Cornelius E. Gallagher (D-N.J.).

The Mathias bill would require tax services that want to use customer information, for example, to compile mailing lists, to get the customer to sign a separate document specifying what information could be used and what uses could be made of it.

A Mathias aide said that such a statement would have to be relatively detailed, and would not merely be a blanket permission. But once he signed the release, the taxpayer would not be informed of the use of the information.

The senator said he introduced the bill because of the large increase in the number of firms offering tax preparation service, particularly with the aid of computers.

Canada Vetoes Action On Software Patents

OTTAWA, Canada – Demand for software protection has come mostly from software houses, according to a report from the Canadian Economic Council.

In recommending against permitting either copyright or patent protection for proprietary programs, the report says software vendors "are not without some practicable means of protecting their merchandise from unpaid appropriation."

Leasing Plan

These means would include leasing instead of selling programs, so the vendors could contractually prohibit their customers from copying or giving the program to others.

The report concludes: "Even if other countries did extend such protection, there might still be good practical reasons for Canada not to follow them." The council opposed any action by Canada to "take a world lead" in affording patent or copyright protection to computer programs, despite the fact that both forms are available in the U.S.

Ampex breaks the throughput barrier

...again.

The Ampex Extended Core Memory that doubled/tripled IBM 360 throughput—and proved it in on-line performance, is now faster than ever... 1.8 µsec cycle time, nearly twice the speed of the original Ampex ECM.

This new 1.8 usec cycle time is more than a fourfold improvement over the IBM 2361 LCS. It operates with IBM 360 Models 65, 67 and 75, with factory modification available to increase speeds of currently operational Ampex ECMs. For System 360/50, Ampex ECM operates at twice the speed of the IBM 2361 LCS.

Price/performance economy is improved with this vastly increased throughput. More than 50 Ampex ECMs are operational. ECM is a "now" add-on to your computer capability. It's expandable from 1 to 8 million bytes, a direct plug-in system to replace IBM LCS with no software changes. It's available on lease or purchase and accompanied by direct Ampex installation and service from a worldwide organization of factory-trained personnel.

Add the increased speed capability, and you'll find yet another reason to call your Ampex representative for a list of operating sites and for all the delivery and pricing details. At the same time, ask about IBM plug interchangeable tape drives, disk file, main-frame memory and other plug-interchangeables from Ampex, the leader in computer peripherals. Ampex (213) 836-5000. Computer Products Division, 9937 West Jefferson Boulevard, Culver City, California 90230.

Visit Ampex, Booth 2217, Spring Joint Computer Conference.

Your computer counts on us.

AMPEX

Chapter Seminars Scheduled

PARK RIDGE, Ill. – DPMA Executive Director R. Calvin Elliott recently outlined a new course of seminars that DPMA will be presenting to its membership and most of them, he said, will be on management.

The seminars, four to six of them a year, will be packaged in complete form so that the chapters will be able to present them without having to incur additional expenses.

The courses will, he said, eventually contain not only the seminar outline but a text book, slides, charts, graphs, sound cassettes . . . "whatever is necessary to allow the chapter to present the complete seminar themselves in one day's time."

Elliott also said that the courses will be constructed to enable their presentation on a part-time schedule for those chapters where the majority of the membership can not attend a day-long seminar.

"Everything needed to run that seminar effectively," Elliott said, "will be dropped into the chapter's lap. It should be used. If a man can't secure the time for it from his company, he should attend on his own time. It's for him."

It is difficult for DPMA, he said, to get the membership thinking in terms of management instead of in terms of equipment, to "stop being obsessed with the technology."

DPMA's Condition 'Very Healthy'

CW Midwest Bureau

PARK RIDGE, Ill. – "DPMA is completely healthy and has all the financial resources necessary to function effectively," R. Calvin Elliott told CW recently. DPMA has reduced its anticipated budget expenditures by an amount "close to $300,000," Elliott said.

The budget reduction was considered as a wise step, he continued, when indications began to demonstrate that the membership and activities income was not going to come up to expectations.

Elliott said membership was not "falling off" but that some growth in membership, anticipated for the current fiscal year, had not materialized.

COMPUTERWORLD

societies/user groups

Effective DP Management Is 'Our Goal,' Elliott Says

By Thomas J. Morton

CW Midwest Bureau

PARK RIDGE, Ill. – The professional in data processing today is hardware indoctrinated and hardware oriented, and is frustrated by the plethora of manufacturer equipment thrown at him. He is so busy just trying to keep up with the technological advances of the industry that he doesn't have, or take, the time to face the real problems confronting him.

That description, given by R. Calvin Elliott, executive director of the Data Processing Management Association, underlies one of the real problems facing the industry today.

'Looking for Answers'

"Members of the industry . . . of the association," Elliott said, "are a frustrated group of people. Things are changing on them so rapidly. Equipment is frustrating them, confusing them. They are people looking for answers."

Elliott said that the DP professional is kept so busy keeping abreast of the technological advances of the industry that he is too occupied to see what is really happening in the DP community and in the outside world that will affect the DP community.

"He doesn't know," Elliott said, "what is happening in the state legislatures, in Federal Government departments, on bills and proposals that will directly touch him or his industry.

"He is such a busy man he doesn't know that his very busy-ness is contributing to a communications gap that is harming him."

Elliott said that he sees the role of DPMA as one which instructs its membership in management of the computer and the leadership of people.

To provide the instruction and the assistance to the DP professional to enable him to manage effectively and to allow him to "break the communications sound barrier with the rest of his company" is the present objective of DPMA, Elliott said.

"Our people," he said, "are going to have more information on how to work with management.

'Unique Opportunity'

"In my opinion," he said, "today's DP manager has a unique opportunity to progress within a corporation. He is an excellent candidate for positions within top management for he has the total records of a company and the total planning of a company available to him. It is up to him to make himself more knowledgeable and therefore more valuable to his company." DPMA, he said, is going to stress the instruction of management techniques for its membership.

While pointing out that he was not criticizing the technological advancements within the industry, Elliott mentioned the trouble they are causing the industry, even causing DPMA.

"Although it has been said by a few people that DPMA should be doing a better job," he said, "it gets extremely difficult to attempt to keep pace with this [technological advancements within the industry]..

He said that it was not the responsibility of DPMA to instruct its membership on "how to run even the newest computer." That, he said, was the responsibility of the manufacturer. "Our job is to teach our people management, the effective management of the computer and data processing."

Random Notes

Flowcharting, Micr, Check Standards Updated by Ansi

NEW YORK – New editions of the standards on flowcharting, Micr encoding and bankcheck formatting have been published by the American National Standards institute (Ansi). None of the new issues include radical departures from prior editions.

The flowcharting manual (Ansi X3.5-1970) has shifted some symbols from the appendix to the body of the standard. The Micr standard (Ansi X3.2-1970) has not modified the E13B font, but has somewhat relaxed the rules on alignment of characters.

The standard on bank checks (Ansi X3.3-1970) includes some changes to clarify the 'auxiliary-on-us' field. The new standards are available from Ansi, at 1430 Broadway.

Ancom Accounts Payable System Runs on 360, H200, Spectra 70

LOS ANGELES – Ancom Systems has developed an accounts payable system to interface with the previously available general ledger system, for IBM 360, Honeywell 200 or RCA Spectra 70 users.

The system is said to automate the clerical functions required to voucher an invoice but still give the user freedom to override the automated functions. Multiple companies can use the system and each can have separate accounting controls. The Cobol programs require 32K of core and one disk and cost $10,000, from 8929 S. Sepulveda Blvd., 90045.

Cyphernet Adds Financial Plan, Report Generating Capabilities

ANN ARBOR, Mich. – Business-oriented users in the Midwest are provided more time-sharing support, with the development of finance planning and analysis, and report generating capabilities on the Cyphernet network.

Complex modeling with large data bases, and analysis and prediction involving cashflow, accounts receivable and merger possibilities can be performed with the financial planning programs. The report generator allows the user to format his output and then enter data from the terminal or extract it from previously stored files. Cyphernetics Corp. is at 333 Maple Village Center.

Electronic Engineers Get Help

DALLAS – Electronic engineers can access five services on the University Computing Company (UCC) network to ease basic design problems.

The capabilities, developed by R/J Associates, Dallas, provide assistance in printed circuit design, MOS layout, and photoplotter artwork. The UCC-R/J services are available in remote batch or time-sharing versions. UCC is at P.O. Box 6171, 75222.

ISA Eases Insurance Reporting

ATLANTA – Insurance Systems of America Inc. has a bond and stock portfolio system designed to aid insurance company managements in making investment decisions, reducing operations workload, and facilitating production of Schedule D.

The system produces the Mandatory Security Valuation Reserve listing in addition to Schedule D. Written in Cobol, the basic program is operational in an IBM 360, and costs $15,000 from 12 Perimeter Center East.

No Need for DP Staff

Package Aids Accounting File Audits

By Don Leavitt
CW Staff Writer

BOSTON – Financial auditors with no knowledge of programming can access computerized accounting files by using the EDP Auditor program from Cullinane Corp.

A set of three coding sheets allows auditors to define the required input, the output format, and the necessary calculations. After minimum training, the auditor should be able to set up and run projects independently of the data processing staff Cullinane said, thus maintaining complete control of the audit process.

With the EDP Auditor, the user can select situations of particular audit importance including items with high unit cost, slow turnover or excess inventory. In accounts receivable or banking, accounts with balances in excess of a specified amount can be identified.

The system permits the computation of ratios and comparisons on large volumes of data. It can also be used to produce audit verification notices and name/address labels for mailings.

Overall file comparisons on inventory counts or value, or on current year vs. prior year expenses are among the capabilities of EDP Auditor, Cullinane said. The computational speed provided by the package allows the user to expand the number and types of tests to be performed, compared with those that would be practical on a manual basis.

The logic of the EDP Auditor is so effective, according to Cullinane, that nonauditors use it to extract test data files, a fraction of the size but carrying the characteristics of the "parent" input file.

The EDP Auditor is written in IBM 360 Assembler language. It has been implemented on the Model 30 and larger 360s, under DOS and SO (MFT and MVT), and on the RCA Spectra 70.

Under DOS, the package is capable of producing multiple reports in one run in 53K bytes of core, exclusive of supervisor, with two work files and sort work space. It is available on a three-year lease for $15,000 one-time charge, or for $500/mo. The package may be purchased for $20,000. Program maintenance for three years is included. Cullinane Corp. is at One Boston Place, 02108.

1400 Emulators Urged to 'ACT' To Convert to Cobol, Assembler

CANOGA PARK, Calif. – The Autocoder to Cobol Translation (ACT) system, from Associated Computing Systems Inc. (ACS), translates IBM 1400 programs to 360 Cobol, right? Yes, but that's only half the story; a version of ACT also provides translation from Autocoder to Assembly language, for those users who don't require the higher-level Cobol.

Even those users who have lost their source programs can take advantage of ACT, ACS said, since a "disassembler" is available to resurrect source statements from object code.

There are five phases in the ACT system, starting with an evaluator and cost estimator which reports the feasibility of translating each user program.

The pre-processor flags Autocoder situations that are untranslatable, and the translation phase converts Autocoder elements directly, or replaces them with ACS-provided subroutines.

The post-processor is said to correct some of the problems flagged by the pre-processor and only partly solved by the translator. The conversion by now, may be as much as 95% complete.

ACT is available as a package for in-house use or as a service from ACS. The translation can be provided in Cobol D, F or ANS level. Implemented on a 150K byte partition on a 360/50, ACT requires one 2314 disk pack and costs $30,000.

The service costs the user 25 cent/source statement. The "disassemble" provision is priced at $100 or $200/program, depending on the length and complexity of the original coding. The firm is at 20944 Sherman Way, 91303.

'Interprocessing' Defined by GE

BETHESDA, Md. – Users may be able to combine the batch capabilities of in-house installations with features unique to a time-sharing network, if field tests of a GE-developed service called interprocessing are successful.

As presently conceived, interprocessing will allow users to create files, or data bases, in-house and then transfer them to the network. Multiple field locations could then access the data for inquiry or updating.

Files would be pulled back to the user's in-house computer center periodically for processing that is more appropriate to a batch mode. When new files are generated, the cycle would be repeated.

GE sees three stages in the development of interprocessing. Stage one, currently in field testing, provides for the data base to be dumped onto tape under operator control at the end of each day. The tape image is then transmitted to the user over data lines and re-created at his site.

Stage two would provide automatic transfer of the data base between user prime installation and time-sharing network.

The final stage of interprocessing capability is expected to allow the user to pull the data base back to the batch installation at any time during the day, without disturbing the use of the data on the time-sharing network.

No date has been announced for availability of interprocessing.

Financial Risks Analyzed

WELLESLEY HILLS, Mass. – Financial planners can include risk analysis in studies of new products, acquisitions, plants or other venture situations, with the Adsim program available as a package from the developer, Applied Decision Systems Inc., or as a service on the Com-Share and National CSS time-sharing networks.

The package and the National CSS implementation allow the user to develop multilevel corporate planning models. Adsim provides a language with which users can express and qualify factors they wish entered. Other programs tend to require fixed values, which must be entered in a fixed format or sequence, according to a Com-Share spokesman.

Adsim users are not forced into entering absolute values for factors. Instead, they may use percentages across a range of values. They don't have to estimate $825,000 in sales, for example. They are free to note a 60% chance of reaching $750,000 a 15% chance of reaching $900,000, etc.

For inhouse use, the Adsim package requires a time-sharing IBM 360/67, operating under CP/CMS. Cost of the basic package is $8,000 from ADS Computing at 36 Washington St., 02181.

Adds 'In-House' Power

Small CPUs Access 360/65 for Big Jobs

MILWAUKEE, Wis. – Users may be able to avoid a hardware upgrade or the initial installation of a medium-scale in-house system, through the remote job entry (RJE) capabilities available from A.O. Smith.

Accessed by terminal or small scale computer, Smith's RJE allows the user at his site to control the IBM 360/65 at Smith.

The firm's application library helps the user develop programs on his own but the Smith system programming staff is available for assistance.

Up to 80% of development costs can be saved, by adapting existing programs to meet user needs, according to Smith estimates.

New programs written in Cobol, Fortran and PL/1 can be compiled through RJE. It is not unusual for a user to run several successive compilations and tests of a program in a single day, with the processing power that is available, Smith said.

Choice of Batch Terminals

Under RJE, the user can operate from any of several remote batch terminals including IBM 1130, 1800, 360/20, 2780 or plug-compatible devices. A user can direct the output of completed jobs to his own terminal, to another terminal or to the high-speed printers at the Smith computer center.

Voice-grade and C-2, 4-wire conditioned lines at 2,000 bit/sec to 9,600 bit/sec transmission speeds support RJE. Certain areas in Wisconsin and Illinois can use A.O. Smith phone lines for computer service at no charge, the company said.

Since Smith cannot be responsible for the effectiveness of user-developed programs, users are billed for CPU and connect time with them. The firm is at 210 W. Capitol, 53102.

Print Tasks Done By Control Cards

HILLSBORO, Ore. – IBM 360 users can handle printing tasks that do not require detailed program logic with the MXO3016 generalized print module from Macrodyn Inc. This RPG-type program uses control cards to develop lists or other formatted output from card, tape or disk input.

MXO3016 formats output in terms of matrices, allowing the full 132 print positions, and 55 lines down the page. The lines can be organized into several blocks across the page, Macrodyn said, so that name/address labels, for example, can be generated efficiently.

The module allows the skipping or processing of selected records from the input file, controls print spacing and provides for the printing of constants.

MXO3016 is written in BAL and operates in 20K bytes of memory under either DOS or OS/360. It costs $500 which covers source code, user documentation and a one-year warranty. The firm is at 29230 N.W. Evergreen, 97123.

Bits & Pieces

Jumbo Nova Chassis Reduces User Cost of Large Minis

SOUTHBORO, Mass. – Data General has effectively reduced the price of large configurations of its Nova 1200 and Nova 800 minicomputers by offering an optional oversize chassis with maximum memory and/or additional I/O circuitry.

Called the Jumbo by the company, the new chassis can accommodate 17 circuit boards, in contrast with 7 boards in the smaller version. The Jumbo chassis costs $850 more than the standard unit. Expansion was previously accomplished by adding a chassis and power supply at a cost of $1,850.

A dual power supply has been added to the standard 800/1200 power supply, giving the Jumbo models three times the power of the standard model, the firm said.

HP Time-Sharing System Offered On 6-Mo Minimum Lease Basis

PALO ALTO, Calif. – Potential users can rent Hewlett-Packard Series 2000 time-sharing computer systems from the company, for a minimum period of six months, according to a recent announcement. The rental contract contains a standard HP service contract and rental prices include basic monthly maintenance.

Under the new plan, an HP 2000A with 16K words of core, mag tape and 500K words of fixed head disk storage will rent for $3,276/mo. A 32K word 2000C, with both fixed head and moving head disk and mag tape, with support for 18 terminals, will cost $5,760/mo. Users can apply 70% of rental payments toward purchase of the system, he noted.

Drum Plotter Charts Available From Alternate Source Vendor

BUFFALO, N.Y. – A line of drum plotter charts, including complex grid patterns, is available from Graphic Control which claims to be the only supplier that is not a plotter maker. All chart materials are available, from standard paper to special materials, such as mylar and triacetate, in sizes ranging from 11-1/2 in. to 31 in. Prices range from $4.75/roll for standard translucent 12 in. charts to $14.25/roll for triacetate 12 in. charts. Delivery is three to five days from 189 Van Rensselaer St., 14210.

Mini Moving Head Disk System Reduces Cost of Random Access

MOUNTAIN VIEW, Calif. – The XMD-2100 moving head disk system from Xebec lowers costs for minicomputer users.

Similar to the IBM 2310, the unit offers 10 Mbits of storage and consists of the interface, controller, power supplies and cables at a price of $7,500. The price includes software consisting of a maintenance program, disk formatter and I/O driver. The unit is available from 918 N. Rengstorff Ave., 94040.

Labels Allow Recording Tape Use

WALTHAM, Mass. – Labels for 800 bit/in. magnetic tapes, from Kybe Corp., provide space for an operator to record the number of times the tape has been used and the date of last cleaning. Labels are priced at $15 per box of 500 and available from 132 Calvary St., 02154.

Rated at 1,500 Line/min

1403-Type Printer Offered for 360s

By Frank Piasta
CW Staff Writer

MELVILLE, N.Y. – The Potter LP3403 chain printer can attain a maximum speed of 1,500 line/min with a 48 character set, using a feature called Adaptive Control, the firm said.

Designed as a plug-to-plug replacement for the IBM 1403 line printers on Systems 360/370, the Potter unit is said to be smaller, faster, and cheaper than the IBM device.

Adaptive Control, Potter explained, allows the initiation of a paper advance as soon as the last character is printed. Conventional printers wait a period of time equivalent to that required to print a maximum length line, Potter said.

The Potter LP3403 incorporates its control unit in the printer cabinet, which results in a savings in floor space, Potter said. For example, an IBM 1403 printer with control unit requires about 21.8 sq ft as opposed to the 7.7 sq ft required by the Potter printer.

A single controller can handle as many as three printers, Potter said. For multiple printer configurations, the printer will also be available without the control unit.

One feature of the LP3403 allows the printed output to pass either through the top front of the printer, or, more conventionally, through the back.

A restriction on the flexibility of the printer's role in a user configuration, and a point of difference with the IBM controller, may result from the fact that the controller cannot handle a card reader/punch unit. Potter, however, said that a reader/punch controller equivalent to the IBM 2821-6, the CC5826, will be available to the user.

The one-year lease price for the LP3403, with controller, is $1,250/mo, compared with the $1,647/mo price for the 1403-N1 with controller. The purchase price will be $56,250. Without the controller, the LP3413 printer will lease for $975/mo and sell for $43,875. The CC5826 card controller leases for $350/mo and sells for $15,750. First shipments will be made during the first quarter of 1972, from 532 Broad Hollow Road, 11746.

A Look at 'Old Reliable'

Teletype Terminal Is Widely Used

By Frank Piasta
CW Staff Writer

The Teletype Model 33 teleprinter is probably the most widely used computer terminal despite the fact that it was designed as a low-cost limited-service unit for use on the TWX network.

Accepted by the computer user because it provided a simple terminal interface at low cost, the Model 33 has undergone changes to lengthen its life and increase its reliability.

Completed in 1966, the changes eliminating many plastic components resulted in increased use of metal parts. This, according to Teletype Corp., has raised the recommended usage from 2 hr/day to 5 hr/day, with a total Model 33 life of 6,000 to 10,000 hours.

The Model 33 user has been able to increase the throughput rate of the terminal by adding paper tape, and, more recently, magnetic tape. These enable data transmission at speeds up to 2,400 word/min.

The user who needs a heavier duty unit than the 33 will have to pay a price of more than three times as high for the Model 35.

The 35 is based on the earlier Model 28 introduced in 1953 for use in wire service applications. It varies from the 28 by using a 7-level code instead of the 5-level code used by the news services.

The 35 offers features such as horizontal and vertical tabbing, and a number of forms widths for sprocket-fed paper. The 35 also offers the user a limited choice of keyboard and character set options.

37 Is Faster

The Model 37 differs from the 35 primarily in offering both upper and lower case characters, and a speed of 150 line/min, 50% faster than either the 33 or 35.

The extended graphics offered with the 37 allow the user to specify a variety of special character sets. These include a special set of symbols for APL, as well as alphabets for foreign languages. The 37 also has the ability to produce charts and graphs.

Line control on the 37 is more flexible, allowing both reverse and forward line feed. In addition, subscripts and superscripts can be printed and the unit can backspace.

The current prices for the three models, in ASR configuration that includes paper tape input and output, are about $900 for the Model 33, $3,200 for the Model 35, and $3,800 for the Model 37.

Hardware Unit Checks Computer Efficiency

CUPERTINO, Calif. – Boole and Babbage, a firm experienced in CPU performance measurement software, has produced its first hardware device, the Measurement Engine.

The hardware system is designed to be used as a stand-alone performance analyzer, or in conjunction with software to help identify performance problems.

The ME-1011 Event Monitor is priced at about $8,000. Peripherals available include the ME-2011 measurement printer, ME-2021 trend recorder (plotter), and the ME-2031 tape drive.

The Measurement Engine is available on a 30-day delivery schedule from Vallco Park, 95014.

Corpak Replaces Memories In Mini, Maxi Computers

LOS ANGELES – Users of either IBM 360/30s or DEC PDP-11s can save money by replacing or increasing their main memory with a Corpak unit from Information Control Corp.

The Corpak 30 for the 360/30 is available in 32K byte increments for a total system capacity of 96K bytes. It has maximum cycle time of 1.5 µsec. The add-on memory system is housed in a table-height console and has its own self-contained power supply.

The Corpak 30 is priced at $41,704 for a 32K byte system. It leases for $960/mo on a two-year lease. First deliveries are scheduled for June.

PDP-11 Version

The Corpak 11 provides the PDP-11 user with up to 24K words of add-on memory in 4K by 16 bit increments up to a total configuration of 24K.

The plug-in interface module contains the necessary decoding and address and data registers. In addition it is compatible with the PDP-11 Unibus. The Corpak 11 is priced at $18,000 for a 24K word system including enclosure and power supply. It will be available in May.

Maintenance of both Corpak units is said to be greatly simplified with the ICC add-on memory since only one interface module is required plus one additional interface for each memory module. The units employ MSI circuitry, and have their own independent power supplies, and are built in easily replaceable modules.

Maintenance on both units will be provided by Sorbus, Inc. Information Control Corp. is at 9610 Bellanca Ave., 90045.

B300 Basis for Small Banking Systems

DETROIT – Burroughs has configured its B300 processor into three low-cost systems for banking applications.

The B343, B344, and B345 Remote/Item Processing Systems are designed to be used by a small bank or branch office to process its own work and operate in conjunction with larger computers.

The new systems are intended to transmit information to and from the CPU directly, either over telephone lines or from magnetic tape for processing on the larger system.

Information can be collected from Micr documents or cards and transmitted, eliminating the usual time delays caused by transporting documents back and forth to the central site.

The B343 provides Item input to a central system through direct transmission of information captured from a remote Micr reader/sorter or card reader. Reporting information may be transmitted directly to the B343.

The processor can have either 4.8K or 9.6K characters of 6 μsec memory. Available peripherals include a 1,000 document/min Micr reader/sorter, 200 card/min reader and 300 line/min printer. The system includes a data communications module with a single dual-line adapter and line speed adapter. Maximum transmission rate is 2,400 bit/sec.

The B344 provides input to a central system from a magnetic tape, which can be shipped to the central system or transmitted by devices such as the Burroughs series N 7000 magnetic tape encoder. Reporting information may be returned to the B344 on magnetic tape for printing at the site.

The B344 configuration follows that of the B343 with the addition of a 50K char/sec magnetic tape drive for the communications equipment.

The B345 includes both the magnetic tape and communications capabilities of the two other models.

Lease prices of Basic B343 and B344 systems range from $1,705/mo to $1,940. Purchase prices begin at $93,120.

Lease prices of the Basic B345 system range from $2,120 to $2,410 per month. Purchase price is $115,680. First deliveries are currently being made, Burroughs said.

System Emulates 2780

LIONVILLE, Pa. – Digital Information Devices has used its Data Transcriber key-to-tape system as the basis for a low-cost IBM-compatible batch/conversational data terminal.

As a batch terminal, the System 3700 emulates the IBM 2780 using standard System 360 software. In the conversational mode, it is Intended to provide for question-answer dialog with a computer or another System 3700. It can be used for remote data entry and off-line printing.

The system combines a 600 line/min, 132 character, printer, magnetic card read/write unit for loading data format and communications control programs, 80/96 column card reader and communications adapter with the Data Transcriber. It leases for about $950/mo and sells for approximately $35,000.

The Data Transcriber features a tape drive that uses a proprietary cartridge, containing 1,200-ft reels of standard 1/2-in. tape.

During off-line printing operations, the 3700 can handle space and line-suppressed data. With communications, data coded for the IBM 2780 can be used directly.

When used for remote data entry, the system can stop the printer as new forms are required, and display supervisory information on the CRT. The system is available on a 120-day delivery schedule from 210 Welsh Pool Road, 19353.

Bits & Pieces

Upper/Lower Case CRT Unit Uses TTY 37-Type Keyboard.

PENNSAUKEN, N.J. – The VST-3700 CRT-Data terminal from Video Systems Corp. features a simulated Teletype Model 37 keyboard and displays both upper and lower case characters. The terminal is available with capacities ranging from 1,296 to 7,776 characters. The units use an EIA RS232C or TTY interface.

As an option, the series may be purchased with a high speed parallel interface. Purchase price range is $2,795 to $4,995 and the lease prices range from $165/mo to $189/mo. Delivery is 30 days from 7300 N. Crescent Blvd., 08110

Data Set Has Acoustic Coupler Can Replace Bell 401 Data Set

MOUNTAIN LAKES, N.J. – An acoustically coupled data set for IBM 1001 and similar equipment from Datron Systems Inc., the Model 713 is functionally interchangeable with the Bell 401 E-2.

The 713 is also said to be less expensive than the Bell Data Phone, with prices ranging from $300 to $500. It is available on a 90-day schedule from 100 Route 46, 07046.

Controllers Allow Attachment of Versatec Units to 18 Minis

CUPERTINO, Calif. – Versatec has developed 18 controllers to adapt its nonimpact Matrix printers and plotters to various mini and midi computers.

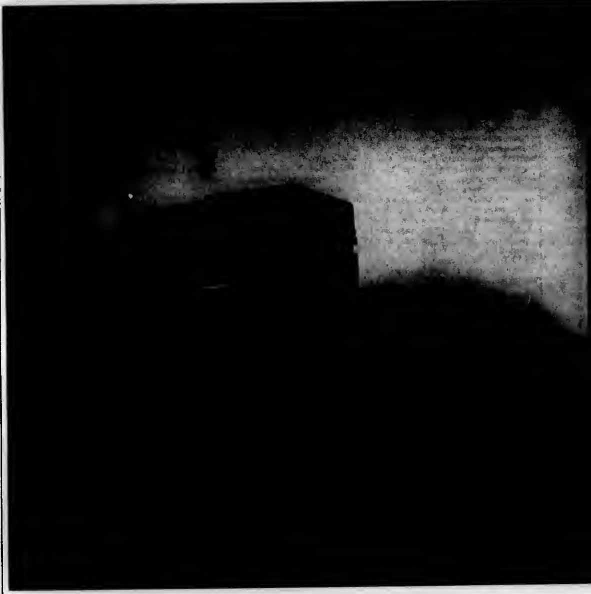
Controllers are available for the following units: DEC PDP-8, -12 and -15; Hewlett-Packard 2114, 2115 and 2116; Data General Nova and Supernova; Varian 520/I, and 620/f; XDS Sigma 2, 3, 5 and 7; IBM 1130 and 1800; and GRI 909.

The prices of the controllers range from $750 to $3,500 and include necessary software, from 10100 Bubb Road, 95014.

Unicomp Minis Gain New Disks

NORTHRIDGE, Calif. – Unicomp has introduced a removable disk cartridge drive using the IBM 2315 cartridge, the Mod 321, for use with its Comp-16 and Comp-18 minicomputers.

Each cartridge provides 12 Mbits of storage and has an average access time of 60msec. Priced at $7,600, the unit is available on a 90-day delivery schedule from 18219 Parthenia St., 91324.



Package Analyzes Phone Costs

By Don Leavitt
CW Staff Writer

NEW YORK – Users with heavy telephone toll traffic can gain control over unjustified usage and costs, and eliminate manual allocation of expenses, with the Telesave analysis program from Pelham Management Systems Inc..

As byproducts of Telesave, users also are provided internal telephone directories, updated monthly, and reports that show the feasibility of Wats band use. Traffic patterns that would permit the use of tie lines, FX lines, TWX or other low cost communications services are also shown in the Telesave reports, the company said.

For input, Telesave uses the so-called Bell "large user tapes" [CW, Feb. 17] or toll ticket information punched on cards and available from local offices of Bell system operating companies.

Data from the tapes or cards is matched against a user-defined list of current credit card or special code billing numbers.

Written in Cobol, Telesava has been implemented on a 32K 360/30 disk system, but could be adapted to RCA Spectra 70, Honaywell 200 or other configuration. It can be purchased outright for $4,800, including source decks, documentation, and maintenance, from Pelham Management, 685 Fifth Avenue, 10022.

Burch Calls Certification Policy Feasible

COLUMBUS, Ohio – The interconnection of non-carrier customer-provided equipment may lead to a policy of standards and certification, according to Dean Burch, chairman of the Federal Communications Commission.

In a recent speech before the Ohio Independent Telephone Association, Burch said preliminary discussions before the FCC had led to "a definite consensus that a standards and certification program can be developed." He said such a program would cause no harm to telephone company facilities or interfere with service to others.

Burch cautioned that much work still remains to be done, however. At issue is the manner in which customer equipment will ultimately interconnect with the telephone network. The Bell System presently requires interconnecting (DAA) devices between its dial-up lines and non-Bell data equipment.

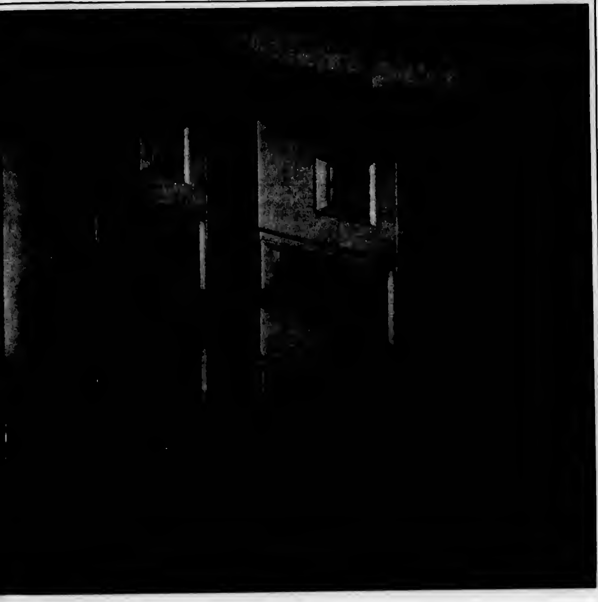
In discussing another issue pending before the commission, Burch said that 33 separate applications, including 1,860 microwave stations, had been received for specialized common carrier links. He said the commission had an obligation to consider the applications "without getting bogged down in a lifetime hearing process."

Communications

The commission has not yet decided whether the public interest would be served by permitting entry of new carriers, he said. But if competition is agreed upon, the ground rules must be the same for all carriers, common and specialized.

In touching on the recent FCC decision in the computer inquiry which prohibited common carriers from providing data processing services, Burch said the action served to impose "arbitrary restrictions [on the carriers] in the name of competition . . . ." He said he agreed, however, that the FCC "should not intrude [its] regulatory arm into the computer area."

The chairman also took note of the eight pending applications for domestic satellite systems. He said the FCC is aiming at a staff recommendation before the end of the year. Factors to be considered include the number of systems to be authorized and whether competition is possible or desirable, Burch said.



Data Briefs

WU Takes Over AT&T's TWX, 41,000 Users Are Affected

NEW YORK – Discussed as long ago as 1943, and recommended by the FCC staff five years ago, the transfer of AT&T's Teletypewriter Exchange (TWX) to Western Union Telegraph finally took place, on April 1.

The sale includes the provision the AT&T will not provide low-speed terminals on dial-up services for five years.

The 41,000 TWX subscribers affected by the sale will eventually be interconnected with the 36,000 subscribers of Telex.

Anderson-Jacobson Has Modem For CRTs, Medium-Speed Printers

SUNNYVALE, Calif. – A high-speed acoustic coupler/modem, the Model Adac 1200, has been developed by Anderson Jacobson Inc. for users with CRT terminals and medium-speed printers which operate in the 30 to 120 char/sec speed range.

Maximum transmission rate is 1,200 bit/sec, but it can be used at lower speeds. The Adac 1200 may be connected directly to a Bell System Data Access Arrangement. The coupler/modem can be purchased for $985 or leased from the firm, at 1065 Morse Ave. 94086.

Crypto Device Allows Sending Sensitive Data Over Phone Lines

SAN FRANCISCO – Sensitive data can be transmitted in coded form over the Bell network with the Mark IV crypto device from Saber Laboratories Inc.

The Mark IV is portable and includes a minicomputer, keyboard and tape printer. A unit is required at both ends.

To prepare a coded message, the user enters clear text information on a Mark IV keyboard, which produces a crypto printed output on a tape printer. On the receiving end, the user decrypts the message by typing in the enciphered text. The firm is at 1150 Bryant St. 94103.

Devices Ease Data Linkage

PALO ALTO, Calif. – The VA100 acoustic adapter from Vedic Corp. allows acoustic or hardware telephone connections with the company's VA300 series of data sets. Transducers surrounded with polyurethane foam immersed in rubber cups assure effective coupling of the telephone receiver to the modem, Vadic said. Delivery is from stock at $110, from 916 Commercial St.

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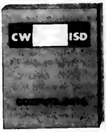
The data offered in these Reports and Profiles describe new products being offered to and by the data processing industry. Included are applications for these products as well as new applications for existing products. Reports include names of suppliers, users who have developed new applications for products, new general developments in the field.



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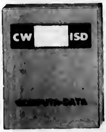
This Profile deals with the granting of data-processing contracts. Included are contracts for hardware, software, and peripherals. The information reported includes, whenever available, the names of the companies involved in the contract; a statement of the proposed work; the length of the contract, its proposed start-up date, etc **(Circle No. 7)**



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10 Marketing Trends & Forecasts

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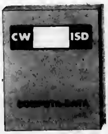
User-Markets: Developments and Applications

Data-processing developments and applications for specific markets and uses of available products (hardware, software, services, etc.) are highlighted in these Reports and Profiles. Included are data detailing how the product is used for specific jobs; its value to specific user-markets; users of the product; companies offering the product; availability of the product, components of packages for user-markets.



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Education

Missouri Opens Document System

COLUMBIA, Mo. – A system for typing, editing, storing and printing documents has been offered to faculty, staff and researchers at the University of Missouri-Columbia by its Computational Services Center.

The center's Administrative Terminal System (ATS) can provide an easy-to-use method for error-free document preparation for campus offices and laboratories in half the time usually required for typing, editing and layout of documents, according to Director Donald Shurtleff.

The offices and labs using ATS need an IBM 2741 Communications Terminal and a telephone coupler. Both the terminal and telephone coupler can be leased from the Computational Services Center.

The ATS commands require a training period of no more than three or four hours to develop reasonable proficiency, Shurtleff said.

The same typewriter terminal also can be used for the Conversational Programming System (CPS), he noted. CPS allows the user to write and run virtually any computer program directly from his terminal.

Among campus users of ATS and/or CPS are the departments of computer science, curriculum and instruction, educational psychology, information science and veterinary microbiology.

The Environmental Health Surveillance Center, Research Reactor Facility and Sinclair Comparative Medicine Research Farm are also ATS and CPS users.

Educational institutions unable to support their own computer centers could tie into the communications network of the Computational Services Center, Shurtleff noted.

"The result could be a great saving in money and time while putting the power of a 360/65 at the fingertips of college students and faculty members anywhere in Missouri."

Both ATS and CPS are available 24 hours a day.

Ripon College Installs Time - Sharing System

RIPON, Wis. – Ripon College has installed a time-sharing system that will be used for teaching students the use of computers, for academic applications in research and problem solving, and for use by such administrative departments as the registrar, alumni, admissions, and various business offices.

The Digital Equipment TSS-8 can serve up to 16 users simultaneously.

Initially, Ripon will have six teletypewriters serving primarily the science, mathematics, psychology, and romance languages departments, as well as administrative offices and other academic departments.

The Ripon public schools also will share the system with the college on a contractual basis, employing their own teletypewriters connected to the TSS-8 via telephone lines.

The decision to purchase its own time-sharing system was the result of an extensive study made by a computer committee of faculty and administrators. Final approval was given by the college board of trustees.

"Far greater utility and long-range economy were the primary factors that influenced the purchase of the TSS-8," noted Bernard Adams, president.

Prior to the installation of the TSS-8, computer services had been obtained from remote terminals to a large-scale computer in a time-sharing center. The cost of the new system will be paid for by restricted private gifts from Wisconsin industries, National Science Foundation funds, and current operating funds allocated for computer services.

Revolutionary Papers Indexed by Computer

WASHINGTON, D.C. – The National Archives is preparing a computerized index of the Papers of the Continental Congress under a $150,000 grant from the Ford Foundation. Students will be able to retrieve the full texts of speeches made at the Congress from a terminal at the Library of Congress.

The National Archives' collection of Continental Congress material will be indexed with the aid of a program called Spindex II developed by the Archives' staff.

Educational Data Processing Group Formed by Massachusetts Teachers

WESTWOOD, Mass. – BIT, a new organization founded by a group of Boston area educators, will bring together interested teachers to discuss new developments of computers in the educational world and promote interest in the use of the computer in many disciplines.

During the winter meeting of BIT the guest speaker, Prof. Ludwig Braun of the Huntington Project in Long Island, discussed "Why Use Computerized Simulation in High School?" Braun spoke about the basic philosophy of the Huntington Project and gave examples of current simulation programs being produced by this project.

His program supports the philosophy that direct experience is the most effective way to learn about a situation. This is not always possible since students study situations which, because of time or materials, cannot be experienced or studied directly.

The Huntington Project's solution is computerized simulation of those situations which cannot be studied directly.

Further information may be obtained from Nathaniel B. Bates, Belmont Hill School, Belmont, Mass.

Plattsburg College To Enter T/S System

PLATTSBURG, N.Y. – Computers are talking in upstate New York, and the group of conversants will increase by at least one this summer, as the state college here enters the third generation of computing.

With terminals at various locations on campus, users can converse directly with its 1440, or indirectly with the Univac 1108 at the State University at Albany.

When Plattsburg State goes third generation with its Burroughs B3500, it will also be able to "talk" with a CDC 6000 at the State University at Buffalo, and an IBM 360/67 in Binghamton.

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Our May 26 Wrap-Up Issue

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'Anti-Snooping' Measure Fails

GLOUCESTER, Mass. – The city council has defeated an "anti-snooping" measure by a 5-2 vote, mostly because the municipal computer does not possess data banking capabilities, local sources report.

A measure had been introduced by Councilor Edward P. Flynn requiring a review of a sampling of each computer program by citizens with computer experience.

Other Uses

The council defeated the proposal after it became convinced that the city's Burroughs L-5000, although possessing some programming capacity, was being used for payroll and tax and water bills, and could not amass private data.

Jared Clark, administrative assistant to the city manager, told CW the only information in the equipment was "that required by law to pay a person." The city of 27,000 purchased the L-5000 for $27,000, around the first of the year.

Dairy Cows Get Balanced Diets

EAST LANSING, Mich. – Dairy cows of the future may receive better balanced diets than most people, because of a computerized ration formulation system recently developed at Michigan State University.

"Use of the computer system to formulate dairy cattle rations will be available to every farmer who has access to a telephone," said Dr. Donald Hillman, MSU dairy nutritionist.

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CI Notes

Cogar Lays Off 300

HERKIMER, N.Y. – After sending up skyrockets of publicity for "Cogar week" at the beginning of the yaar, Cogar Corp. last week announced the layoff of 300 of its 650 workers. The Cogar 4 data entry terminal, introduced with several other products during Cogar week, will apparently go into dormant moda. President George Cogar said the layoff "would significantly curtail sales activity end production" et the Information Systems Division in Schuyler, N.Y.

A spokesmen said the firm would continue technical activity on the system but would not go back into sales activity or production until corporete finences improve. The firm is said to have lost $3.5 million on sales of $150,000 in the last fiscal year.

Three Electroluminescent Phosphors Available

TOWANDA, Pa. – Tha aveilability of three electroluminescent phosphors for tha electrical end electronic industries has been ennounced by the Chemicel and Metallurgical Division of GTE Sylvania Inc. The phosphors are: Yellow Type 523, zinc sulfide:Cu:Mn; Green, Blue-Green, or Blua Type (depending upon the current); Green 723 zinc sulfide:Cu, and Blue Type 814, zinc sulfide:Cu.

The new phosphors ere suitable for CRT readout displays end in the fabrication of large-area information displeys such as those used in commercial and militery ships, combat information centers and aircraft treffic control centers. Prices range from approximetely $33 to $43 e pound.

Wescon Plans 28 Tech Sessions

SAN FRANCISCO – Wescon's technical program committee is aiming for 28 sessions for its program during tha convention here in August. Tha sessions will include two specialized "subprograms" which will concentrate seven sessions each on the computer end information technology end the solid-state manufacturing areas of technology.

Supershorts

Mergenthaler Linotype Co., a division of Eltra Corp., and SYS Computer Corp. have signed an agreement whereby SYS will supply Mergenthaler with devices incorporating its Model 1000 Microprocessor. The equipment will be marketed by Mergenthaler as a peripheral display in its line of typesetting systems.

– – –

Digital Information Devices, Inc. has signed a marketing agreement with D C Industries, Pty, Ltd. of Melbourne, Australia.

– – –

A plated wire computer memory has been built for the first time in a proprietary Planar Coax package, the Bunkar-Ramo Corp.'s Electronic Systems Division has announced.

Early applications for the new development include Bunker-Ramo's BR-1018 computer, a miniaturized avionics computer about the size of a telaphone. The company sees the possibility also of producing memories in Planar Coax for other manufacturers.

10 Products Scheduled

Panasonic to Launch OEM Push at SJCC

NEW YORK – Panasonic will launch a major push into the U.S. OEM market with the introduction of two minicomputers and eight peripheral devices at the Spring Joint Computer Conference next month.

The Japanese firm is following the footsteps of Fujitsu Ltd. into the American market, but hss decided on the OEM approach in contrast to the end user avenue used by Fujitsu.

Panasonic hasn't announced prices on the products that will be shown.

- Panasonic MC-7S minicomputer, specifically designed for small systema, with a minimum core memory of 1K words, is expandable to 16K. The unit has a word length of 16 bits plus parity with a cycle time of 4 μsec.
- The Panasonic MC-7F mini has a plated wire memory that gives a cycle time of 600 nsec. It hss a 4K memory, expandable to 16K and word length of 16 bits plus parity.
- A general-purpose mark reader, the JK 204, for documents and cards interprets crooked and skewed lines. It accepts documents up to 10 in. wide of any length, which are punched, preprinted or pencil-marked. The JK 204 reads by a reflected ray detecting system, and almost any mark scan form can be used as Hollerith input, the firm said. Output is Ascii. Sixty 40-col card/min or thirty 80-col card/min can be handled. Documents can be read at a top speed of 960 bit/sec.
- A card reader capable of handling sixty 40-col card/min or thirty 80-col card/min, the Panasonic JK 205, can accept up to 250 cards per hopper.
- Panasonic's transactor, JD 201, is a self-contained data handling system featuring Panasonics' MC-7S mini with 2K core memory, expandable to 4K, IBM Selectric typewriter, paper tape I/O and sn optical mark reader for both cards and sheets.

The starting point is the IBM 74 basic typewriter module, which has been augmented for full I/O capabilities through the use of Panasonic's Panawriter Kit.

- The Panawriter kit, Model JK 102, enables a manufacturer to assemble an IBM 73 equivalent I/O device in less than seven houra. The JK 102 features a cassette type ribbon, and a speed of 15.5 printing cycle/sec.
- The Panaprinter JB 501 digital printer is designed with a motor driven only during the printing process. It is available in two standard models, both of which will print 120 line/min. Panaprinter Type G is designed to print 15 digits: 12 numerals, a minus sign, and two available for special symbols or identifications. The Type H Panaprinter can print 16 digits: 13 numerals, a minus sign and two special symbols.
- Four-pole key magnets and low resistance reed switches are used in the construction of three new Panasonic keyboards, JB 131, JB 132 and JB 172, that cost slightly over $1/key.
- A paper tape photo reader, Model JK 206, is capable of a speed of 240 char/sec, will do step or successive reading of up to eight-level code, and has an output of positive logic at 0 V and 5 V levels.
- In addition, acoustic delay lines, JB-205 and JB-206, designed primarily for character display applications in CRT units will be introduced. Delay time of JB-205 is 5.27 msec and 1 msec to 8 msec is available by option. JB-206 is 16.67 msec and 8 msec to 20 msec is available.

GE's Refractory MOS Process Uses Molybdenum as Gate Metal

SYRACUSE, N.Y. – A new technique has entered the competition for dominance in the MOS production field – the Refractory MOS process from the GE Integrated Circuit Products Department. At the same time the firm has announced several new products made with the process.

The new technique usea molybdenum as the gate metal of the MOS device, in comparison with aluminum gate and silicon gate MOS devices.

Since molybdenum can withstand temperatures far in excess of 1,100°C without melting, the moly can be applied before diffusion is performed. This results in self-alignment between the gate and diffused region and thus provides minimum gate-to-source and gate-to-drain capacitance, according to GE.

Very low gate conductor sheet resistance is one of the several major advantages of the RMOS process, GE added. Gate conductor sheet resistance of moly is .15 Ω/square, compared to other normally used silicon which is 40 Ω/square.

The RMOS process offers an advantage over conventional aluminum gate MOS, in that moly is nonreactive with SiO_2, avoiding any possibility of aluminum gate reaction with the gate oxide at high temperatures, and resultant gate oxide thinning or failure, the firm added.

GE engineers claim that the RMOS technique has inherent speed advantages over silicon gate MOS: For example, in a 256-bit memory, based on data established by GE engineers, the total line delay time for silicon-gate would be 54 nsec, whereas RMOS delay time would be 0.20 nsec. In a 1,024-bit memory, silicon-gate line delay time would be 216 nsec, compared with RMOS delay time of .8 nsec.

The smaller size of RMOS circuits compared with conventional MOS circuits is achieved by three basic means, GE said. First, tha double level metal (moly and aluminum) interconnect system combined with P-diffusion interconnect layer basically provides three levels of interconnects. Second, the self-registration feature of RMOS allows the transistor gates to be smaller than conventional MOS. Third, the shallow P-diffusion and lower operating voltage of RMOS enable P-diffused regions to be closer together.

Two of the new products are Dual 100-bit Dynamic Shift Registers, designated tbe GER 1507 and the GER 2507, for general digital data storage. The GER 1507 is designed to have maximum clock rate of 1 MHz and the GER 2507 has a maximum clock rate of 5 MHz.

The tbird new product is a 256-bit static RAM, designated GER 1101. It is available in two versions; the GER 1101, with 1.5 μsec access time, and the GER 11011, with an access time of 1 μsec.

The unit is fully decoded, interfaces with TTL/DTL logic, and requires no clock since the circuit is dc stable. Power dissipation is 2 mW/bit and is available in ceramic 16-lead dual-in-line package.

The process was developed by Dr. Dale M. Brown, Dr. William Engeler, Dr. Marvin Garfinkel, and Dr. Peter V. Gray, of the GE Research and Development Center in Schenectady, N.Y. Three U.S. patents on RMOS device fabrication recently were granted to the inventors.

DoD Directive Bars Sole-Source DP Procurements When Upgrading

By Alan Drattell

CW Washington Bureau

WASHINGTON, D.C. – A Department of Defense (DoD) directive to all military agencies has effectively barred sole source procurements when upgrading computer systems.

And a task force, under the direction of Col. Joseph Warren, deputy comptroller for data automation with DoD, is expected to recommend to an ad hoc committee on implementation of public law 89-306 (the Brooks Bill enacted over five years ago) that the directive be made effective throughout the Federal Government.

There is doubt, however, in some government circles that the DoD memo or the expected recommendation from Warren's task force will do much to really change the way the Federal Government does business with computer companies.

The DoD directive affirms and reemphasizes "the policy of fostering free and full competition in the selection, replacement and modification" of automatic data processing equipment.

It mentions equipment from two manufacturers being affected specifically and states that a vendor's newer equipment compatible with installed machines but having a better cost/performance ratio will not justify a waiver to an earlier DoD directive whicb requires "equal opportunity and appropriate consideration be given to all manufacturers who offer equipment capable of meeting systems specifications."

The current directive, from Assistant Secretary of Defense (comptroller) Robert C. Moot's office, cites the specific upgrading of IBM's 360 to 370 and Univac's 1004 and 1005 to 9000 computers.

"While proposals (to upgrade) may appear extremely attractive on the surface," the directive adds, "several factors must be considered in making decisions in any given situation.

"It is essential that equipment replaced be recognized as a sola source procurement and justification developed accordingly. Generally, other alternatives are available," including competitive replacement of installed equipment.

Warren explained that agencies will now "have to cover all bets before asking for a sole source upgrading."

Suit Charges GA Deceived Salesman

CW Midwest Bureau

CHICAGO – General Automation, Inc., (GA) is named as defendant in a $1.4 million suit filed by a former GA Midwest marketing representative who charges that the firm's representations on the price and the availability of equipment, specifically GA's 18/30 computer system, were inaccurate, fraudulent and deceiving.

The complaint, filed here by Carl Myrick of Lisle, Ill., in the U.S. District Court for the Northern District of Illinois, also charges that General Automation denied Myrick commissions due him for sales made while employed by GA.

General Automation, through its agents and representatives, made deliberate false and fraudulent statements that caused the plaintiff to resign his position with IBM and accept a position with General Automation as Midwest marketing representative, the suit alleges.

Sales Support Lacking

The complaint states Myrick had been assured by General Automation that he would be provided with sales support in the form of systems engineering personnel, which, the plaintiff states, was never provided.

Representatives of GA assured him, Myrick alleges, that the 18/30 system he was being hired to sell had features comparable to the IBM 1800 and that they could be sold at about one-half the price of the 1800.

FAA Buys 5 Raytheon Radar Displays

WASHINGTON, D.C. – The Federal Aviation Administration has purchased five automated radar displays for $18.2 million, under a contract with the Raytheon Co., bringing to 10 the total number of computer display channels bought under an authorization for 16.

Fourteen units will be installed in Air Route Traffic Control Centers in the U.S., and one at the FAA Academy at Oklahoma City. The first unit has been delivered to the Agency's National Aviation Facilities Experimental Center (Nafec) near Atlantic City, N.J.

Flight Information

The computer display channels will provide controllers with such flight information as aircraft identity and altitude, directly on the face of their radar scopes. The information is written electronically on displays in the form of small, alphanumeric data "tags" that automatically follow the progress of each controlled flight. The units are one of the major components of the automated systems now being implemented at the 20 air route traffic control centers serving the Continental U.S.

Questions on Europe Peripheral Market?

NEW YORK – Peripheral equipment manufacturers seeking information on the European marketplace should get in touch with Nathan L. Samuelson, president of Cavanagh Computer Leasing Co., who will be examining the European scene on a forthcoming trip.

Samuelson is inviting inquiries from domestic manufacturers who have specific questions about the market that they would like answered on an informal basis. There will be no charge for the service. Cavanagh's offices are located at 825 Third Ave., 10022.

Disk Checkout Station

IBM's disk storage products are gathered here for testing by a 370/155 at IBM Systems Manufacturing Division, San Jose, Calif. In the foreground is the 2319 disk storage facility, immediately behind the 2319 is the 3330 disk storage facility, immediately behind the 3330 is the 2305 fixed head storage, and in the background is the 155. The 155 is also used to test the 2314 disk storage facility, the 2311 disk storage drive and 2321 cell drive.

Pins Not Small Enough

SO. PASADENA, Calif. – "Connectors with pin centers only .025 in. apart will be needed in the near future, and types with .050 in. centers – needed today – are already available for the computer industry," according to an industry executive.

Roger Bowen, director of engineering of Microdot Inc.'s Connector Division, indicated that as computers go to higher speeds and smaller sizes for a given capacity, the .100 and .150 in. pin spacings currently in use can no longer provide the required performance characteristics.

Since .100 in. spacing is about the best that can be done with wire wrap, other termination methods need to be found, such as welding and flow soldering, he said.

"A recent trend is to back plane connectors, where you plug a PC board in one side, and the other side is wire wrap. The wire wrap pins are on .100 in. centers, and many manufacturers are now trying to develop techniques for reducing this to .050 or .025 in. centers," he indicated.

"It seems incongruous that you can put thousands of active and passive components on a small chip, and then be limited by leads that can be spaced no closer than one-tenth of an inch apart. That's a barrier that must, and will, fall in the near future," Bowen said.

Hitachi Patents Available for License

TOKYO – Hitachi, Ltd., one of Japan's giants with sales last year of $2.8 billion, has announced the availability of 513 of its U.S. patents for licensee arrangements. Selected from over 20,000 patents granted to the company, a partial list of the Hitachi patents in the computer category include a system for curve plotting including interpolation; a method and system for detection of pattern features; an electrical device for compensating a digital execution time in hybrid computer systems; and a pen-tracking system in CRT display equipment.

I/O Memory Device

Also, an opto-electronic input and output memory device and a transistor switching circuit having a compensating circuit and magnetic materials having regular hysteresis loops.

CCA to Design DoD Data System

CAMBRIDGE, Mass. – Computer Corp. of America has received a contract from Arpa, the Advanced Research Projects Agency of the Department of Defense, covering the first year of a planned three-year project, leading to the creation of one of the world's largest on-line laser information systems, with a capacity to store files of up to one trillion bits.

The information system will be integrated into a computer network being created by Arpa.

Through communication facilities, computers at various universities and research centers will have access to this information system, which will provide facilities for the storage and management of large, shared files of research data and programs.

One of the most significant files to be stored in this system contains detailed meteorological information going back many decades, and will serve as a data base for construction of global climate models.

The system will employ a Unicon laser system manufactured by Precision Instruments Corp. in addition to auxiliary tape and disk files.

CalComp's CD 22/14 replacement for the IBM 2314 system. Each 2-high cabinet stores up to 58 million 8-bit bytes.

Computers Make Up Largest Part Of Business Machines Exports

CW Washington Bureau

WASHINGTON, D.C. – Electronic computers, peripheral equipment and parts accounted for the largest segment of exports of business machines from this country last year, according to a report issued recently by the Bureau of Domestic Commerce of the Department of Commerce.

Computers, peripherals and parts accounted for 67% of business machines exports, for a total of $1.1 billion. Of the total, digital computers comprised $428 million, parts $281 million and peripheral devices $224 million. Major customers included West Germany, the UK, France, Canada and Japan.

Statistical machines used with punched card or tape, including auxiliary machines, and parts shared 8% of exports at $131 million. Leading customers were Canada, the Netherlands, the UK, West Germany and Japan.

Meanwhile, calculators represented the largest segment of business machines imports – 18% or $93 million. Italy, Japan, West Germany, the Netherlands and Argentina were the chief suppliers.

Data processing machines, including punched card units, tape readers, tape punches, card readers and other EDP machines totaled $43 million or 8% of imports in 1970, increasing 91% from 1969. Canada, Italy, France, Japan and the UK were the principal countries of origin.

James Landon to Head RCA Canada Computer Systems Division

MONTREAL – RCA Ltd., Canada, has announced the appointment of James N. Landon as vice-president and general manager of computer systems.

Landon succeeds Richard J. Campbell, who was named to a new administrative staff position with the RCA Data Processing Division, one of four operating divisions in the recently restructured RCA Computer Systems organization.

Prior to his new assignment, Landon was division vice-president of marketing programs for RCA's Computer Systems Division, the forerunner of the Data Processing Division.

Executive Corner

In his new position, Landon will direct the marketing and field engineering operations in Canada for both the company's new series of advanced computers – the RCA 2, 3, 6 and 7 – and the Spectra 70 series.

Other Moves

- Logic Corp., Cherry Hill, N.J., has filled three new vice-presidential posts: Lewis A. Barr has been appointed vice-president, marketing; William E. Fahy Jr. has been named vice-president, finance, and Joseph Mowery has become vice-president, engineering.
- Mits Tamura has been named vice-president and manager of systems and programming of Proprietary Computer Systems Inc. of Los Angeles.
- Anthony A. Barnett was elected vice-president of the Bunker-Ramo Corp., Trumbull, Conn.
- Thomas L. Ringer has joined Computer Machinery Corp., Los Angeles, as vice-president, sales.
- Computer Terminal Corp. of San Antonio has appointed Marvin J. Franklin executive vice-president and member of the board of directors.
- Librascope Division of The Singer Co., Glendale, Calif., has promoted Harlan Buseth to vice-president, operations.
- John H. Kalbach has joined Datapro Research Corp. of Philadelphia as vice-president and director of marketing.
- Comma Corp. of New York has named R. William Grenier vice-president, marketing/government.
- Corporation S of Dallas has elected Richard J. Nagy vice-president and controller.
- Robert D. Eisenhardt Jr. has been promoted to vice-president, business and industrial systems operations, of Control Data Corp.
- Morgan R. Walker has been appointed vice-president of marketing of Sykes Datatronics, Inc., Rochester, N.Y.

Orders and Installations

Digital Equipment Corp.'s Radiotherapy Planning System (RAD-8) has been installed at the Hospital Maison-neuve in Montreal, Canada.

Gammon South East Asia Berhad of Singapore has installed an NCR Century 200 as the nucleus of a management information system designed to assist in the planning and supervision of building projects throughout Southeast Asia.

A Honeywell Model 635 has been installed at the U.S. Naval Academy in Annapolis.

The University of California at Irvine has selected a Digital Equipment Corp. PDP-10 to assist in faculty and graduate research in the physical sciences.

A Digital Equipment Corp. PDP-8/E has been ordered by American Airlines for its facilities at LaGuardia Airport in New York.

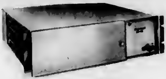
The Charles River Laboratories, Inc., Wilmington, Mass., has ordered an IBM System/7 to help speed the reporting of data from blood analyses and other tests.

Scan-Data Corp., Norristown, Pa., has sold a Model 200 page-reading system, valued at more than $225,000, to the Bendix Corp. for its Kansas City, Mo., facility.

A $1 million Univac 1106 computer system has been ordered by the University of Cape Town, S. Africa.

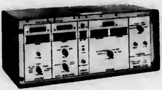
Mitsui Bank Ltd., Tokyo, has purchased an optical recognition (OCR) system, valued at about $900,000, from Recognition Equipment (Japan) Inc. for use in its utility billing system, credit card billing and general bank DP applications.

Nasa's Langley Research Center, Hampton, Va., has installed a Control Data 6400 computer system.



Datacraft Core Memory

GE's 12 in. CRTs



Digital's Memory Exerciser

25% Savings Promised

Flexible MAC Expands Lockheed Line

LOS ANGELES – Flexible MAC, a custom OEM version of the MAC Jr. minicomputer, can effect a cost saving up to 25% for many minicomputer users, according to the manufacturer, Lockheed Electronics Co. The unit provides expansion from 2K to 28K words of 16-bit memory within the computer chassis, and offers a 1 µsec cycle time.

Flexible MAC can be configured in a 19-in. chassis with 30 logic card slots or a 24-in. chassis with 39 slots. Major functions – the CPU, up to 28K of memory, peripheral controllers and power supply – of almost any system configuration can be accommodated within one chassis. Logic card kits are available for customized special functions.

Shipments began in January from the firm at 6201 E. Randolph St. 90040.

New OEM Products

Datacraft Core Memory Is Field Expandable

FT. LAUDERDALE, Fla. – The DC-38 is a general-purpose 800/900 nsec core memory system from Datacraft that is field expandable. The DC-38 uses only two types of printed circuit card assemblies – timing and control board and digital stack board.

On the timing and control board are mounted address and data register, I/O interface logic, terminations and timing and control for up to 32K words of memory. On the digital stack board are mounted the interface logic to the timing and control board, a 4K planar core array and all analog circuitry associated with core driving and sensing. Each 4K incremental increase of memory capacity requires the addition of one digital stack board.

Power supply requirements are +5V for logic and +15V for the drive supply. The power requirements have been reduced by typically 20% in a 16K system and as much as 60% in a 32K system, the firm said. The company may be reached through P.O. Box 23550, 33307.

GE Announces 12-in. CRTs

LOUISVILLE, Ky. – Two new 12-in. cathode ray display tubes, the monochrome Y-4059 and Y-4137, are rectangular glass CRTs from GE's Tube Products Department. They feature 74 sq in. viewing area, all angle mounting and 90° magnetic deflection. Both tubes employ low voltage electrostatic focus.

The Y-4059 offers typical .011-in. resolution line width (1,400 limiting TV line resolution) for use in equipment requiring low-sweep power consumption. The Y-4059 is available in limited production quantities while the Y-4137 can be supplied in sample quantities for evaluation, from the firm at 2100 Gardiner La. 40205. The Y-4059 and Y-4137 are priced at $34.75 each in quantities of 100. Samples for evaluation purposes are priced at $52.12.

Compulite Has Pushbutton Switch

IRVINE, Calif. – A computer grade illuminated pushbutton switch, featuring split legend for a miniature 5/8-in.square lens cap, is now available from Compulite Corp. Designated the Model 28, this compact pushbutton switch features momentary or alternate actions with hard gold contacts rated from low level to 10 A resistive at 117 Vac, 50,000 cycles.

Prices run from $2.70 to $4.48, depending on quantity or options from the firm at P.O. Box 4377, 17795 Sky Park Circle, 92664.

Portable Memory Exerciser Shown

SAN DIEGO, Calif. – Digital Development Corp. has developed a Portable Memory Exerciser which is now available for the disk and drum marketplace.

SP-50 can provide up to eight channels of parallel write data and compare the resultant memory system read data for data errors. The data generator may be programmed to output respective track addresses, a fixed 15 bit repetitive data pattern, or a variable 15 bit repetitive data pattern.

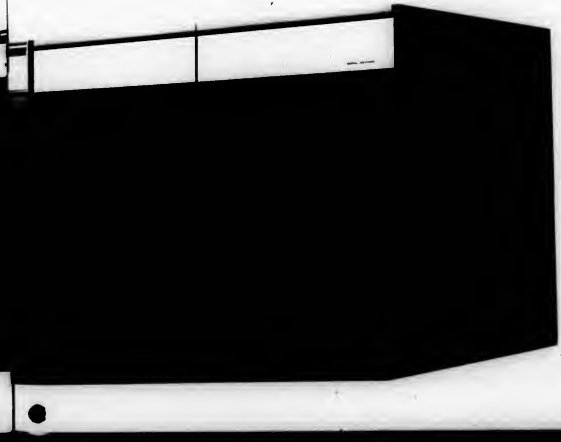
The exerciser will provide up to 12 address lines capable of sequentially addressing all or part of 4,096 data tracks.

SP-50 is powered by 115 or 240 Vac, 50-60 Hz. DC power required by the exerciser logic is supplied by a self-contained +5 Vdc, 10A power supply. Unit price for the SP-50 is $9,275 from DDC at 5575 Kearny Villa Road, 92123.

Transmit-Only Unit Available

POMPTON LAKES, N.J. – The Holmes Tycom Input/Only writer is now available as a transmit-only device from Terminal Equipment Corp. The Tycom transmit-only terminals – Models 701, 703, 705 – have been developed by utilizing the patented Holmes Tycom Applique, in conjunction with a standard IBM Selectric typewriter, Models 711, 721; 713, 723; 715, 725, respectively.

The Applique is designed for integrated circuit (DTL/TTL) interface compatibility. Specially designed sense elements feature bounce-free, springless, high-reliability sealed micro-reed switches. The pickup resistors for the switches terminate in a printed circuit board contained on the Applique inside the typewriter. The device is available at $400/unit or $180 in quantities of 100 from the firm at 740 Hamburg Tpke, 07442.



Analysis

Is IBM Losing Some Ground to Dwarves?

By Michael Merritt
CW Staff Writer

ARMONK, N.Y. – Like the thrashings of a brontosaurus trying to work his way out of a tar pit, the recent efforts of IBM to hypo its sales and earnings have produced an awful lot of splashing but not much movement.

First quarter revenues of the industry giant are up 8.7%, from $1.72 billion in 1970 to $1.87 billion in 1971. Per share earninga are 8.4% higher than last year at $2.19, up from $2.02, and net earnings are up 8.9%, from $230.26 million to $250.81 million.

Worldwide rental and service revenue was the bright spot in the picture, increasing 15.9%.

In earlier days, though, 16% growth was expected from the entire company.

Chairman Thomas J. Watson Jr., said that "net orders booked in the first quarter were disappointing, especially in the U.S."

This indicates that though orders for the 370 may be coming in fast and furious, there is also a high level of discontinuances and cancellations.

IBM, in other words, is continuing to lose some ground to the dwarves.

Watson also noted that IBM's unfilled order backlog "continues to be substantial, but if the current trend continues, it will result in lower rates of growth in rental and service gross income."

It is understood in the industry that IBM salesmen are again falling behind quota, though not as seriously as they did in 1970. Watson's ominous statement conceding the possibility of a permanent downturn in IBM's growth rate confirms the assumption that the DP giant is having trouble keeping up its pace of the last two decades, now that it is one of the five largest industrial companies in the U.S.

Watson did say that "we are optimistic about the outlook for long-term growth in data processing," but such a "light at the end of the tunnel" statement is new to Armonk.

For a long time IBM was the archetype of the well-managed, growing company. Expanding 9% when you are IBM's size – and in the middle of a recession, too – is still a remarkable feat, and a testimony to the company's vigor. But perhaps the time has come when 15% to 20% growth is just no longer possible; eventually the dinosaurs ran out of food.

Big Lift for Small Firm

The first turnkey data processing system designed to eliminate front and back office paperwork problems for small brokerage houses has been installed at Marrocco & Co., in Brookline, Mass. The system was developed by Search, Inc.

Financial

Data General Sales Up in 2d Period

SOUTHBORO, Mass. – Data General Corp. has reported increased sales and earnings for the 12 weeks ended March 13, 1971, the second period of its current fiscal year.

Sales for the period were $2.8 million as compared with $1.4 million reported for the second period last year.

Earnings after taxes for the recent period were $308,000 or 13 centa per share, contrasted with the $108,000 or six cents per share, assuming full taxes had been payable, reported for the comparable 12-week period last year.

Acquisitions

Cambridge Computer Corp. and Princeton Time Sharing Services, Inc., have reached an agreement in principle whereby Princeton would merge with a wholly owned subsidiary of Cambridge, and all outstanding capital stock of Princeton would be exchanged for Cambridge stock at the rate of one share of Cambridge stock for each four-and-a-half shares of Princeton stock.

The proposed transaction is subject to the preparation and approval of a formal agreement by both parties.

DMS Computer Industries, Ine., Englewood Cliffs, N.J., a firm engaged in providing DP services to hospitals. Under the terms of the agreement, DMS Computer Industries stockholders will receive two shares of NCS stock for every NCS share outstanding.

Grumman Data Systems Corp. has acquired 80% of the outstanding common stock of North American Computer and Communications Corp. and its wholly owned subsidiary, Computility. Both firms offer time-sharing services.

Earnings Reports

ANALOG DEVICES
Three Months Ended Jan. 30

	1971	1970
Shr Ernd	$.08	$.10
Revenue	2,770,000	2,453,000
Earnings	106,000	125,357

COMPUTER TECHNOLOGY INC.
Yeer Ended Dec. 31

	1970	a1969
Shr Ernd	.....	a.18
Revenue	$39,409,000	32,678,000
Eernings (Loss)	(2,522,000)	1,030,000

a-Resteted.

DATATAB INC.
Year Ended Dec. 31

	1970	1969
Shr Ernd	.....	e$.13
bRevenue	$3,929,054	3,437,882
Spec Chg	d262,485	43,646
Earnings (Loss)	(301,027)	a118,043

e-Based on income before special charge. b-From continuing operations. d-Principally the write-off of the company's investment in e joint venture and the write-off of previously deferred systems development costs. e-Equal to 20 cents a share.

RCA CORP.
Yeer Ended Dec. 31

	a1970 (000)	b1969 (000)
Shr Ernd	$1.26	$2.27
Revenue	3,325,562	3,409,853
Earnings	91,735	159,832

a-Results were edversely effected by e 101-day strike. b-Reslated by compeny.

UNIVERSITY COMPUTING CO.
Year Ended Dec. 31

	1970	e1969
bShr Ernd	.....	$2.50
Rev	$113,927,000	90,371,000
Cont Op (Loss)	(3,079,000)	c18,892,000
Loss Disc Op	5,570,000	88,000
Spec Chg	d8,916,000	.....
Earnings (Loss)	(17,585,000)	16,826,000

e-Resteted to exclude all sold and discontinued operetions. b-Based on income before speciel charge. c-Equal to $2.51 e share. d-Consists of e $4,797,000 loss from writedown of goodwill associated with certain operetions and e $4,119,000 loss from the cumulative effect on prior years of accounting changes.

Nickels & Dimes

Trial inclusion of Big Board stocks on the Nasdaq system is raising NYSE hackles. Exchange President Robert W. Haack, in a letter to the SEC, said the listing "is inimical to the investors and the concept of a central marketplace." The chief complaints seem to be lack of regulation and that shibboleth of shibboleths, the possibility of a disorderly market. Reports so far say the Nasdaq system is working beautifully. The shape of things to come?

$$$

Cherry Hills' Computest is having a bad time in fiscal year 1971. Nine-month earnings were down to $394,000, or 42 cents a share, from $580,000 or 62 cents a share a year ago. Shipmants were down 8% to $7.5 million from $8.2 million a year ago. Third quarter sales were less than two thirds of the year earlier's, and third quarter per share earnings wilted to four cents a share from 30 cents.

$$$

Devonshire computer serial number one (the last of the run) is being auctioned off by the IRS. Software and documentation included.

$$$

A statement in General Dynamics' annual report seems to imply that the Stromberg-Datagraphix Division, up to now a chronic money loser, turned an operating profit in the second half of fiscal year .1970. For the year, though, the COM leeder still caused the parent a loss of over $12 million.

$$$

Trouble continues at Comress. 1970 revanues were off 13%, from $5 million to $4.3 million, and the net loss increased from $536,000 to $744,400. Late 1970 cost cutting should decrease expenses by about $90,000 a month, according to Comress President Fred Ihrer. Ihrer also predicted a profit for 1971. Current assets are $2.8 million, end current liabilities only $530,000.

$$$

Danbury, Conn.'s Graphic Sciences has declared a 25% stock dividend. Remember what those days were lika?

$$$

Banner year for Programming Mathods – Revenues were up 56% to $6.7 million, and earnings climbed 38% to $555,000, or 66 cents a share. In 1969 the company made $402,000, or 48 cents a share, on sales of $4.3 million. PMI has managed to get better six years in a row, now, somathing rather nice for a softwara house.

$$$

Correction

Last week Nickels and Dimes reported that the SEC had charged Vlatron Computer Systems with filing misleading statements of debt. The SEC has made no such charge, nor, to our knowledge, has anyone else.

Computerworld Stock Trading Summary

All statistics
compiled, computed
and formatted by
TRADE★QUOTES, INC.
Cambridge, Mass. 02138

CLOSING PRICES THURSDAY, APRIL 15, 1971

SOFTWARE & EDP SERVICES

EXCH		1971 RANGE (1)	CLOSE APR 15 1971	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCED COMP TECH	2- 4	2 1/4	0	0.0
A	APPLIED DATA RES.	5- 15	9 1/2	- 7/8	-8.4
O	APPLIED LOGIC	1- 5	1 1/2	0	0.0
O	ARIES	1- 2	1 3/8	0	0.0
N	AUTOMATIC DATA PROC	44- 59	56 1/4	- 3/4	-1.3
O	AUTO SCIENCES	5- 8	5 3/4	-1	-14.8
O	BOOTHE DATA SYS	1- 2	1	- 1/4	-20.0
O	BRANDON APPLIED SYS	1- 1	7/8	+ 1/4	+40.0
O	COMPUTER AGE INDUS.	1- 2	3/4	0	0.0
O	COMPUTER ENVIRON	1- 2	1 1/4	0	0.0
O	COMPUTER INDUS.	4- 5	5	0	0.0
O	COMPUTER NETWORK	3- 10	10 1/4	+2 3/4	+36.6
O	COMPUTER PROPERTY	6- 10	9	+ 1/2	+5.8
N	COMPUTER SCIENCES	9- 15	14 1/4	+ 7/8	+6.5
O	COMPUTER TASK GROUP	1- 1	1	0	0.0
O	COMPUTER USAGE	5- 16	10	- 1/2	-4.7
O	COMP AUTOMOT REPORTS	6- 11	10 3/4	+3	+38.7
A	COMPUTING & SOFTWARE	27- 45	44 1/2	0	0.0
O	COMRESS	2- 3	3 1/8	+ 1/8	+4.1
O	COMSHARE	4- 7	6 1/2	+ 5/8	+10.6
O	CONSOL. ANAL. CENT.	1- 2	1 1/2	+ 3/8	+33.3
O	DATA AUTOMATION	1- 4	2 3/4	- 3/4	-21.4
O	DATA PACKAGING	7- 10	8 3/4	- 1/8	-1.4
O	DATAMATION SERVICE	1- 3	1 3/8	0	0.0
L	DATATAB	4- 10	9 1/2	+1 1/4	+15.1
O	DIGITEK	1- 2	1 5/8	0	0.0
O	EDP RESOURCES	7- 13	12 1/4	+1	+8.8
A	ELECT COMP PROG	3- 7	5 3/8	- 5/8	-10.4
N	ELECTRONIC DATA SYS.	64- 85	74 1/4	-4 3/4	-6.0
O	INFORMATICS	7- 12	11 3/4	- 1/8	-1.0
A	ITEL	15- 23	22 1/2	+1	+4.6
O	KEYDATA CORP	10- 14	12 5/8	+ 7/8	+7.4
A	MANAGEMENT DATA	8- 11	9	- 1/2	-5.2
O	NATIONAL CSS INC	7- 14	14	- 1/4	-1.7
O	NAT COMP ANALYSTS	1- 4	3 3/8	+ 3/8	+12.5
O	NAT.COMP. SERV.	2- 3	2 3/8	0	0.0
N	PLANNING RESEARCH	16- 26	23 3/8	- 5/8	-2.6
O	PROGRAMMING METHODS	18- 29	22 1/2	+2	+9.7
O	PROGRAMMING & SYS	2- 4	3 1/8	- 1/4	-7.4
L	PROGRAMMING SCIENCES	1- 3	3/8	+ 1/8	+50.0
O	SCIENTIFIC RESOURCES	1- 2	1	- 1/8	-11.1
O	SOFTWARE SYSTEMS	1- 2	1 1/4	0	0.0
O	TBS COMPUTER CENTERS	5- 9	6 1/2	+1 1/2	+30.0
O	TOLLEY INTL CORP	3- 8	7 1/2	+1 1/4	+20.0
O	UNITED DATA CENTER	2- 6	5	- 1/8	-2.4
N	UNIVERSITY COMPUTING	21- 32	29 1/8	-1 1/8	-3.7
A	URS SYSTEMS	7- 11	8 7/8	+ 3/8	+4.4
O	U.S. TIME SHARING	1- 3	2 1/2	+ 3/4	+42.8

PERIPHERALS & SUBSYSTEMS

EXCH		1971 RANGE (1)	CLOSE APR 15 1971	WEEK NET CHNGE	WEEK PCT CHNGE
N	ADDRESSOGRAPH-MULT	24- 36	33 3/8	-2 3/8	-6.6
O	ALPHANUMERIC	3- 6	4	0	0.0
N	AMPEX CORP	17- 25	24 1/8	+ 3/8	+1.5
O	ASTRODATA	1- 2	1 1/4	+ 1/8	+11.1
O	ATLANTIC TECHNOLOGY	3- 6	5 1/8	0	0.0
A	BOLT,BERANEK & NEW	6- 8	8 3/4	- 3/8	-5.2
N	BUNKER RAMO	10- 17	16 1/8	+ 3/4	+4.8
A	CALCOMP	23- 33	30 5/8	-1 5/8	-5.0
O	COGNITRONICS	6- 9	6 7/8	- 1/4	-3.5
O	COLORADO INSTRUMENTS	4- 8	5	+ 1/2	+11.1
O	COMPUTER COMMUN.	6- 19	14 1/2	-1	-6.4
A	COMPUTER EQUIPMENT	4- 6	5 3/8	- 1/4	-4.4
A	COMPUTEST	13- 20	14 5/8	- 3/4	-4.8
O	CONSOL COMPUTER LTD.	8- 11	11 1/4	+ 7/8	+8.4
A	DATA PRODUCTS CORP	6- 10	8 3/8	0	0,0
O	DATA TECHNOLOGY	3- 8	7 3/8	+1 5/8	+28.2
O	DIGITRONICS	4- 8	4 3/8	- 1/4	-5.4
N	ELECTRONIC M & M	8- 14	12 3/4	- 1/2	-3.7
O	FABRI-TEK	2- 3	3 1/4	- 1/8	-3.7
O	FARRINGTON MFG	1- 3	2 3/8	0	0.0
O	FOTO-MEM INC	2- 6	3	+ 1/8	+4.3
O	INFOREX INC	31- 48	44 1/2	-3 3/4	-7.7
O	INFORMATION DISPLAYS	5- 8	6 3/4	-1	-12.9
O	MANAGEMENT ASSIST	1- 2	1	+ 1/8	+14.2
A	MARSHALL INDUSTRIES	18- 24	21 7/8	0	0.0
A	MILGO ELECTRONICS	18- 26	19 1/8	-1 1/8	-5.5
N	MOHAWK DATA SCI	23- 41	39 1/2	+1 3/4	+4.6
O	ON LINE SYSTEMS INC	7- 18	17	- 1/2	-2.8
O	OPTICAL SCANNING	13- 18	15 1/2	-1 1/2	-8.8
O	PHOTON	7- 12	10 7/8	0	0.0
O	PHOTO-MAGNETIC SYS.	1- 1	7/8	- 1/8	-12.5
A	POTTER INSTRUMENT	17- 25	23 1/8	- 1/8	-0.5
O	PRECISION INST.	7- 14	9 1/2	-2 3/4	-22.4
O	RECOGNITION EQUIP	14- 26	21 1/2	- 1/4	-1.1
O	REDCOR CORP.	5- 9	7 1/4	- 3/8	-4.9
N	SANDERS ASSOCIATES	13- 22	21 1/8	- 3/4	-3.4
O	SCAN DATA	8- 11	7	- 1/8	-1.7
O	TALLY CORP.	11- 16	14	+ 1/4	+1.8
N	TELEX	15- 22	20 3/4	-1	-4.5
O	VIATRON	1- 4	1	- 1/4	-20.0

SUPPLIES & ACCESSORIES

EXCH		1971 RANGE (1)	CLOSE APR 15 1971	WEEK NET CHNGE	WEEK PCT CHNGE
N	ADAMS-MILLIS CORP	14- 19	17	+ 1/4	+1.4
O	BALTIMORE BUS FORMS	6- 10	10	+ 1/4	+2.5
A	BARRY WRIGHT	8- 13	10 5/8	- 1/8	-1.1
A	DATA DOCUMENTS	18- 29	23 3/4	-1 1/2	-5.9
O	DUPLEX PRODUCTS INC	8- 10	9 1/2	0	0.0
N	ENNIS BUS. FORMS	10- 13	13	+1 5/8	+14.2
O	GRAHAM MAGNETICS	9- 33	32 1/2	+4 3/4	+17.1
O	GRAPHIC CONTROLS	6- 12	12 1/4	+2 1/2	+25.8
N	MEMOREX	54- 78	62 1/4	-6 7/8	-9.9
N	3M COMPANY	96-116	112 1/4	-1 3/8	-0.9
O	MOORE BUS. FORMS	37- 42	40 7/8	+ 1/8	+0.3
N	NASHUA CORP	29- 41	40 1/8	- 3/8	-0.9
O	REYNOLDS & REYNOLD	37- 50	49 1/4	- 3/4	-1.5
O	STANDARD REGISTER	19- 23	21 3/4	+ 1/4	+1.1
O	TAB PRODUCTS CO	8- 14	11 3/4	- 1/2	-4.0
N	UARCO	25- 30	28 3/8	+ 1/4	+0.8
A	WABASH MAGNETICS	8- 10	9 1/4	- 1/2	-5.1
N	WALLACE BUS FORMS	18- 25	24 3/4	+2	+8.7

COMPUTER SYSTEMS

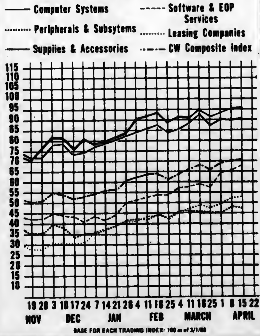
EXCH		1971 RANGE (1)	CLOSE APR 15 1971	WEEK NET CHNGE	WEEK PCT CHNGE
N	BURROUGHS CORP	105-130	128	+3 5/8	+2.9
N	COLLINS RADIO	14- 20	19 5/8	+ 3/4	+3.9
N	CONTROL DATA CORP	48- 69	66 5/8	+1 1/2	+2.5
O	DATA GENERAL CORP	19- 40	39 3/4	+2 1/4	+6.0
N	DIGITAL EQUIPMENT	53- 73	69 3/8	+1 3/8	+2.0
N	ELECTRONIC ASSOC.	5- 8	7 3/8	+ 1/8	+1.7
A	ELECTRONIC ENGINEER.	5- 9	8 1/4	+ 1/4	+3.1
N	FOXBORO	25- 41	38	- 1/8	-0.3
O	GENERAL AUTOMATION	12- 26	22	- 1/2	-2.2
N	GENERAL ELECTRIC	94-120	119 1/4	+2 1/2	+2.1
N	HEWLETT-PACKARD CO	30- 45	40 1/8	- 1/4	-0.6
N	HONEYWELL INC	83-115	110 3/8	-4 1/4	-3.7
N	IBM	310-364	356 1/4	- 1/2	-0.1
O	INTERDATA INC	6- 11	10 1/4	- 1/2	-4.6
N	NCR	38- 47	42 1/4	-1 7/8	-4.2
N	RCA	26- 37	36 5/8	+1 3/4	+5.0
N	RAYTHEON CO	27- 40	39 1/2	- 1/8	-0.3
O	SCI. CONTROL CORP.	1- 2	1 1/4	- 1/8	-9.0
N	SPERRY RAND	25- 38	37 3/8	+1 1/4	+3.4
A	SYSTEMS ENG. LABS	14- 18	14 3/4	+ 1/8	+0.8
N	VARIAN ASSOCIATES	13- 18	17 1/8	- 3/4	-4.1
N	VICTOR COMPTOMETER	17- 27	21 5/8	-1 7/8	-7.9
N	WANG LABS.	29- 47	46 1/2	+4 1/2	+10.7
N	XEROX CORP	85-110	106 7/8	-1 1/4	-1.1

LEASING COMPANIES

EXCH		1971 RANGE (1)	CLOSE APR 15 1971	WEEK NET CHNGE	WEEK PCT CHNGE
O	BOOTHE COMPUTER	13- 27	27	+1 3/8	+5.3
O	BRESNAHAN COMP.	2- 4	3 1/2	+ 1/8	+3.7
O	COMPUTER EXCHANGE	4- 9	5	- 1/4	-4.7
A	COMPUTER INVSTRS GRP	8- 13	13 1/8	+ 3/4	+6.0
N	DATA PROC. F & G	11- 19	18	+ 3/8	+2.1
O	DATRONIC RENTAL	2- 4	3 1/4	+ 1/8	+4.0
A	DEARBORN-STORM	24- 40	40	+3	+8.1
O	DIEBOLD COMP. LEAS.	5- 11	10 1/8	+ 1/2	+5.1
A	DPA, INC.	4- 8	7 1/4	- 3/8	-4.9
A	GRANITE MGT	9- 13	10 7/8	+ 7/8	+8.7
A	GREYHOUND COMPUTER	7- 11	10 1/8	- 3/8	-3.5
N	LEASCO CORP	16- 22	21	+1 1/8	+5.6
O	LECTRO MGT INC	2- 4	3	- 1/4	-7.6
A	LEVIN-TOWNSEND CMP	5- 9	7 1/8	- 1/8	-1.7
O	LMC DATA, INC.	1- 1	1	0	0.0
O	NCC INDUSTRIES	3- 8	7 3/8	- 3/8	-4.8
O	SYSTEMS CAPITAL	3- 6	3 3/8	+ 1/8	+3.8
N	U.S. LEASING	18- 23	22	- 5/8	-2.7

EXCH: N=NEW YORK EXCHANGE; A=AMERICAN EXCHANGE
L=NATIONAL EXCHANGE; O=OVER-THE-COUNTER
O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID
(1) TO NEAREST DOLLAR

Computer Stocks Trading Index



BASE FOR EACH TRADING INDEX: 100 as of 3/1/68

Earnings Reports

DATA PROCESSING FINANCIAL & GENERAL

Nine Months Ended Feb. 28

	a1971	1970
bShr Ernd	$1.15	$1.15
Spec Chg	c396,000	d2,022,340
eEarnings	4,222,803	2,193,954

a-Includes increased depreciation charges of $900,000 resulting from a change in depreciation policy effective June 1, 1970. b-Based on income before special charges. c-Additional provision for losses on investment in affiliates less recovery on settlement with IBM. d-From writedowns and sale of various assets. e-Equal to $1.05 a share in 1971 and 60 cents a share in 1970.

DATA PACKAGING CORP.

Three Months Ended Feb. 28

	1971	1970
Shr Ernd	.....	$.18
Revenue	$2,337,494	4,148,101
Earnings (Loss)	(123,035)	289,891

VIATRON COMPUTER SYSTEMS

Three Months Ended Jan. 31

	1971	1970
Revenue	$930,000	$194,000
Loss	1,734,000	a3,834,000

a-Restated to reflect an accounting change.

MARSHALL INDUSTRIES

Nine Months Ended Feb. 28

	1971	1970
Shr Ernd	$.21	a$.99
Revenue	15,549,600	19,646,600
Spec Cred	.....	b355,200
Earnings	185,700	c1,242,900

a-Based on income before special credit. b-Consists of an income tax reduction from loss carryforward and gain on sale of partnership interest. c-Equal to $1.38 a share.

AMERICAN COMPUTER LEASING

Year Ended Dec. 31

	1970	1969
aShr Ernd	$.72	$.64
Revenue	8,488,278	7,033,092
Tax Cred	638,230	390,777
bEarnings	2,110,800	1,704,636
a3 Mo Shr	.16	.12
Revenue	2,379,841	1,806,438
Tax Cred	265,767	82,910
bEarnings	600,330	343,321

a-Based on income before tax credits. b-Equal to $1.03 a share in the year and 29 cents a share in the quarter of 1970, compared with 84 cents a share and 17 cents a share respectively, in the like periods of 1969.

PHOTON INC.

Year Ended Dec. 31

	1970	1969
Shr Ernd	.....	$.28
Revenue	$19,222,311	18,037,676
Spec Cred	b763,774	.....
Earnings (Loss)	(526,108)	1,106,444

a-Includes 1970 accounting policy change writing off $3,492,859 of deferred research and development costs in 1970, compared with $418,024 in 1969. b-Principally from settlement of patent suit partially offset by write-off of certain investments.

VICTOR COMPTOMETER CORP.

Year Ended Dec. 31

	1970	1969
Shr Ernd	a$1.28	$1.73
Revenue	163,282,465	161,579,157
Spec Chg	b3,081,343	.....
Earnings	c3,610,387	8,954,131

a-Based on income before special charge. b-Write off of computer division deferred startup costs incurred in 1969 and 1970. Had the 1969 portion of special charge been made to income in the year incurred, earnings for 1969 would have been $7,659,379 or $1.47 a share. c-Equal to 66 cents a share.

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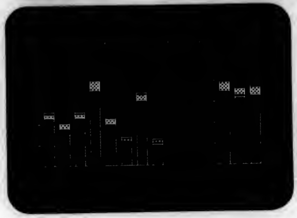

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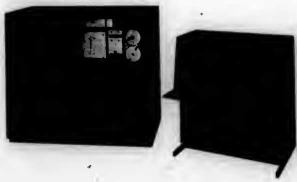

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